THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888

No. 43. OCTOBER 22, 1949 VOL. 61.

PAPERS PRESENTED TO CONGRESS, N.V.M.A.

(*Continued from page 682*)

DISEASES OF HOUSEHOLD ANIMALS COMMUNICABLE TO MAN

By

J. WINSSER, D.V.M., M.D.

(INSTITUTE OF PREVENTIVE MEDICINE, DEPARTMENT OF BACTERIOLOGY AND EXPERIMENTAL PATHOLOGY, LEIDEN, HOLLAND)

For the consideration of this paper there was a very fine attendance in the Great Hall of the Central Hall, Westminster, on the afternoon of Saturday, August 13th, under the chairmanship of Mr. W. A. Pool, M.R.C.V.S., Director of the Commonwealth Bureau of Animal Health. In the circumstances explained below, the assembly did not have the privilege of the presence of the essayist, but it will be a source of satisfaction to him to know that his greatly appreciated contribution to the proceedings of Congress stimulated one of its best-sustained discussions.

The CHAIRMAN: You will all, I am sure, share my deep regret that the author of the paper we are to consider this afternoon, on the important subject of " Diseases of Household Animals Communicable to Man," is unable to be with us. This paper has been written by Dr. J. Winsser, of the Institute of Preventive Medicine, Leiden, Holland, who, until recently, was President of the section for small-animal diseases of the Dutch Veterinary Association. Since agreeing to prepare the paper Dr. Winsser has been called up for military service in Indonesia. His paper is therefore being presented by Mr. Joh. C. Peters, of Rotterdam, whom we welcome most warmly (applause). Mr. Peters was responsible with Dr. Winsser and Dr. Ojemann for the foundation of the small-animal section of the Dutch Veterinary Association (already referred to) and succeeded Dr. Winsser as President of the Section on the latter's departure for military service. Mr. Peters was a veterinary officer in the Dutch Army during the war and has been veterinary surgeon of the Rotterdam Zoological Garden. It is with great pleasure that I call on Mr. Peters.

Mr. JOH. C. PETERS (Rotterdam): I am very sorry to say that Dr. Winsser is unable in person to present to you his paper on " Diseases of Household Animals Communicable to Man," for he had to join the Dutch Army as a medical officer, going to Indonesia in due course. He asked me to express his deep regrets for not having the opportunity to meet the prominent English members of the profession, to see the splendid laboratories and institutes of England and to attend this interesting Congress, but he wishes to offer his cordial thanks for the great honour rendered to him by the invitation to send a paper on the subject mentioned above.

In this paper Dr. Winsser has tried to give a review of the most important infectious diseases of small animals, communicable to man, occurring in the Netherlands, as recorded in the Dutch literature of the last decade and he has added, besides facts from his own experience, some data from the literature of other countries. He is aware of the fact that most of what he has written will be known to you from your own observations in England but he is interested in learning your opinion and your experience in practice and laboratory.

For me, as an ordinary practitioner, it will be an extremely hard task to take Dr. Winsser's place in the discussion, being in the habit of considering the subject of his paper more from the clinical side than from the scientific one. That is why I hope to hear many interesting data and a few difficult questions. Nevertheless, I should like to add some experiences of my own.

The question, " Can this animal be in any way a danger to the health of young children ? " is often put to us and the average owner of a pet expects us to be able to give a direct answer to it. We all know the truth is quite different. The symptoms of most contagious diseases are often rather vague and the causative agent hard to determine. The practitioner is not in the favourable position of the scientist, who can found his diagnosis on an elaborate *post-mortem* and bacteriological investigation. Besides this fortunate individual can spend the time he needs and postpone his judgment till the examination is ended. Of course, we, too, can make use of microscopical, allergic and even serological tests. But only positive results can give certainty; negative ones never do exclude a suspected infectiousness, and that is just the thing the client demands.

Moreover, I have to recognise that, although our colleagues in the laboratories, working on diseases of cattle and poultry, and even the staff of medical institutions, are most willing to help us in single cases, we have in our country no laboratory fulfilling the needs of the small-animal practitioner, nor bacteriologists, specialised in this sphere, at the Veterinary Faculty of the University. I sincerely hope you are in a more favourable position.

Coming to the diseases named in this paper, we see that a great deal of prominence has been given to tuberculosis. Although I may have failed sometimes to recognise a case, I venture to say that in my practice at Rotterdam it is not the most frequent of them. Canine leptospirosis, for example, is a far more common diagnosis. I admit that it is easier to take a blood sample for the serological test than to persuade the owner of a dog or cat to control the temperature during a whole day after the subcutaneous injection of tuberculin, and perhaps the first test is more reliable than the second one. A positive tuberculin test proves only that the animal has been exposed to contamination, not that it is suffering from the disease and spreading the bacilli. I am eager to learn if you have experience with tuberculin from strains isolated in canine or feline cases.

X-ray examination can be helpful in the diagnosis of affections of the thoracic cavity, but it demands great experience to interpret the picture. I wanted to show you some specimens by projection, but did not succeed in having lantern slides made.

In cats, the thickening of the pleurae and mediastinum, the enlarged glands and the spreading of the pleural exudate over irregular cavities give a very vague picture. Owing to

the shape of the thorax, the left-lateral direction of the rays will prove an advantage, but for a separate view of each lung the dorso-ventral direction is necessary.

In monkeys there is a great difference between the species. In the baboon I obtained the most beautiful radiographs—the lungs disseminated with tubercles of different size, without pleural exudate. In anthropoids there is a considerable resemblance to human cases—tubercles, infiltrates and exudate. The shape of the thorax favours the dorso-ventral direction. In the callitriche I never found lesions of the lungs in tuberculosis, only the abdominal type with enlarged mesenteric glands and liver foci. I found the bacillus *intravitam* in fistular and pleural exudate and in sputum in an orang outan and in skin lesions in a Siamese cat. The latter case healed after a prolonged treatment with ultra-violet rays. This animal is still, six years afterwards, in good health, having produced several sound litters in this time.

Although monkeys are very susceptible to contamination by human beings, and in zoological gardens preventive measures are taken against aerogenic infection by placing glass screens between the animals and the public, I think tuberculosis is by no means a rare disease in natural circumstances. I saw a high mortality from tuberculosis in new consignments, straight from the places where the animals had been captured. Of course, I cannot exclude the possibility of contamination during transport and I am not able to antedate the process, but when I find big tubercles and caseation, together with miliary tuberculosis of the parenchymatous organs, I am apt to consider it as a chronic case with an acute exacerbation under the unfavourable circumstances of the transport.

In the same consignments I saw several cases of bacillary dysentery of the chronic type, showing fibrinous membranes and ulcerations of the colon and rectum—also very dangerous to man. In anthropoids we had some cases of this disease in animals that were for years in a captive state. Before I started my practice in the Rotterdam zoological garden in 1940, the keeper of the monkeys fell ill with bacillary dysentery during an outbreak of this disease in the anthropoids he had to nurse.

Monkeys affected by tuberculosis or bacillary dysentery may look in good health for a long time and show symptoms of illness only in the latest stage of the disease. Therefore newly arrived animals have to be thoroughly examined—best by radiography of the lungs and bacteriological examination of the fresh faeces. Nursing personnel has to be controlled regularly, to avoid contamination of both man and animal.

As small-animal practitioners, in particular those in seaport towns, will be called in from time to time to treat monkeys, I wished to draw your attention to the danger those two diseases can cause to the owners.

Canine leptospirosis is no rare occurrence in my practice at Rotterdam and I often meet with several cases within a short period in the surroundings of a canal or other stagnant water. In the first days of illness a big dose of specific serum* often brings rapid recovery; in the next stage penicillin proves a good remedy. The most characteristic symptoms often are absent and the exact diagnosis can only be made by finding the leptospirae or by finding a considerable rise in the blood titre about two weeks after the first symptoms of illness. I made a custom of sending blood samples of every suspected case at the first examination and two weeks afterwards, thinking this test indispensable for personal control.

I met cases that seemed very clear, showing the typical symptoms of canine leptospirosis and recovering promptly after specific treatment, but failing to give a positive serological test. I wonder whether my diagnosis was faulty or whether the animal was failing to form the antibodies it should do; also if the penicillin treatment, that prevents the multiplication of the leptospirae, does not thereby interfere with the formation of antibodies.

The interesting data in this paper concerning salmonellosis and streptococcosis draw our attention to the frequent occurrence of specific infections among our patients that cannot be recognised by the symptoms alone. They do accentuate the need for routine laboratory investigation as an aid to diagnosis in small-animal practice: not only to prevent contamination to man and animals but to indicate rational therapy and to estimate the value of our customary therapeutic measures.

I had a case of *Salmonella enteritidis* in a kangaroo, caused by the "ratin" bacillus, used to destroy rats. The symptoms were of paralysis and emaciation, without diarrhoea. In one dog that had ingested this preparation, that is said to be harmless to all animals but rodents, I saw a severe diarrhoea and death in a short time.

Three dogs, belonging to one owner, showed symptoms of haemolytic streptococcosis. The first case, brought in in a miserable state, died; the others recovered after sulphamezathine treatment. Unfortunately, at that time I could not get glucose-broth to try to isolate the germ from the blood.

The diagnosis of skin diseases, caused by fungi, by microscopical examination of scabs and hairs, is not as simple as it looks. Errors are possible and I do think it a good plan to have one's judgment controlled from time to time by laboratory workers with more experience. I had a case of microsporosis in a young chimpanzee. Although I got good results with a salicylate ointment, now I am trying one containing 10 per cent. fatty acids. I prefer washing the animal once a week with chloramine-solution (7 per cent.) for preventing further contamination. I should like to hear your opinion about the need of epilation in these cases.

I thank you for your hearing and am eager to hear your remarks and possible objections.

Mr. Winsser's paper was as follows:—

Diseases of Household Animals Communicable to Man*

Keeping animals as pets in the dwellings of man has been practised from ancient times. The presence of the dog, originally kept for hunting, could be demonstrated even in the lake dwellings of old tribes. Anyone contemplating the paintings of the Dutch and Flemish school expressing family life, will find, with regularity, the dog as a household animal and friend of man; less frequently monkeys, cats and cage birds are represented.

In the Netherlands the majority of small domestic animals are family pets; the animal often sleeps with a human member of the family in the same bed, is kissed, or food is transferred from the human mouth to the muzzle

* In a letter dated September 2nd, Dr. Peters wrote: "Perhaps it might be of interest to the readers of *The Veterinary Record* to know that the serum against leptospirosis I mentioned is a mixed one, against *L. icterohaemorrhagiae* and *L. caninum*; also that the fungus found in the swabs of the chimpanzee was not a *Microsporum*, but has now been identified as being an *Epidermophyton tropicale*.

* Presented to the Sixty-Seventh Annual General Meeting and Congress of the National Veterinary Medical Association, in London, August 13th, 1949.

of a dog or the beak of a pigeon, and it is fortunate that in our regions small animals are rarely carriers of dangerous pathogens communicable to man, like rabies, histoplasmosis and kala azar. But some diseases of our pets may be indeed a threat to public health and I restrict myself to those which are somewhat common in our country, being aware of the fact that perhaps many will be known to you in England from your own observations.

Tuberculosis

Tuberculosis of dogs and cats is rather frequent in the Netherlands and every animal, suffering from this disease, is a potential danger to human health. Many observations and experiments have been made in England by DOBSON, GRIFFITH, INNES, KIRK, LOVELL and WHITE, STABLEFORTH, and others, but most work is done in France, tuberculosis of dogs and cats being particularly prevalent in Paris and Lyons. Large size dogs are susceptible not by race but on account of malnutrition. Among cats, the Siamese are more susceptible. Doubtless, as in man, the amount of virulent bacilli ingested and inhaled, the duration of exposure to contamination and the degree of resistance of the individual are factors of the utmost importance.

In dogs infections with the human type of tubercle bacillus predominate, whereas in the cat infection with this type is rare. VERGE and SENTHILLE (1942) state, referring to the literature from the beginning of this century, that from 592 strains, isolated from dogs, 389 belonged to the human type, and 189 to the bovine type, whereas only twice could an infection with the avian type be observed (FELDMANN, PLUM); out of 131 strains, isolated from cats, 125 were of the bovine type and 6 the human type (CONTI, HJARRE, RABINOWITSCH, VAN GOIDSENHOVEN & SCHOENAERS). The cat seems to be very resistant to infection with the human type of tubercle bacillus: KUWABARA exposed cats to infection with the human type by means of food, injections or residence for 2-3 years in the rooms of human beings suffering from open tuberculosis of the lungs, but none of the animals contracted tuberculosis.

Avian tuberculosis, rather frequent in chickens and swine in the Netherlands, is rarely demonstrated in man: BONNET, THIEFFRY & MONTEFIORE, DANBOLT & BRANDT, JENSEN, LESTER & TOLDERLUND, BRADBURY & YOUNG, FELDMAN & co-workers. There may be some doubt, however, if the cases described are really of avian origin, direct infections from chicken to man are difficult to prove and in most human cases the isolated bacillus is described as closely related to the avian type of tubercle bacillus. In the Netherlands, BEKKER has published a human case, clinically suspected of renal tuberculosis, in which an acid-fast rod could be isolated from the catheter urine; the bacillus behaved like an acid-fast saprophyte but differed from all strains known up to the present.

In tuberculosis of dogs, the aerogenous route of infection predominates (sniffing), whereas cats are more exposed to a food-borne infection (milk). Although the former may contract bovine tuberculosis from garbage (black market), it seems that the dog has more resistance to the bovine type of tubercle bacillus than to the human type. In general, the carnivores possess a fair resistance to tuberculosis, in contrast to man who acquires resistance only following an initial infection.

At autopsy, the route of infection may often be clear. Theoretically, in cases of tuberculosis, a primary lesion (ulceration), indicating the portal of entry, may be found (Cohnheim's law), followed by swelling of the regional lymph glands (Parrot's law " des adénopathies satellites "). As a rule, at autopsy, the primary lesion has disappeared. According to VERGE and SENTHILLE, old tuberculous foci may be observed in the mesenteric glands—particularly in the cat—without primary intestinal lesion, but with recent specific lesions in the lungs which are not accompanied by swelling of the regional lymph glands. As analagous to human pathology, the primary complex may heal, but as a rule is followed by lymphogenous and/or hæmatogenous dissemination (Ranke's law), giving rise to numerous small foci on the pleura, pericardum and peritoneum. Such an animal will not survive to reach the phase of final localisation in the organs (chronic organ tuberculosis).

In cases of involvement of both thoracic and abdominal organs, VERGE and SENTHILLE think the infection to be food-borne when a primary lesion in the intestines may be demonstrated or at least a distinct enlargement of the abdominal lymph glands, with caseation, whereas an air-borne infection is accepted when, besides lesions of lungs and pleura, specific foci are demonstrated in the liver, spleen, kidneys and peritoneum, without clear tuberculous lesions in the abdominal lymph glands. A food-borne infection, however, may give rise to a thoracic infection, via the diaphragm, without distinct abdominal lesions.

The histology of the tuberculous lesions varies, according to the animal species, the allergic state, the organ localisation, virulence, number of bacilli, etc. In a negative allergic state, exudation predominates, in a positive allergic state productive processes prevail (HÜBSCHMANN), as we can often see in the carnivores: the lesions are built up of epithelioid cells, lymphocytes, plasma cells and a few granulocytes, giant cells not being present. In some cases the productive process may be so excessive that sarcoma-like tumour formations are formed in which the real diagnosis can be made only by demonstrating the causative agent (SUTTER). Caseation and calcification may occur (TEUNISSEN observed a case with calcification of the abdominal lymph glands) but necrosis and liquefaction are more common, giving rise to " caverns " (" bronchiëctasia " is a misnomer) in the lungs. NIEBERLE characterises the tuberculous infection of the lungs in carnivores as a primary productive process with mal-development of the lesions in the regional lymph glands, and a bronchial spread (productive bronchitis and peribronchitis). He stresses the predominance of air-borne infections in the cat in contrast to the cultivated fur-bearing animals (mink, fox, racoon), in which the infection is mostly food-borne, with intestinal tuberculosis and hæmatogenous dissemination to the lungs.

The clinical signs and symptoms in cases of tuberculosis in dogs and cats are as a rule not characteristic. Special forms are fistulæ following inflammation of the submaxillar or cervical glands (portal of entry: the tonsils), primary skin tuberculosis in cats followed by a secondary tuberculosis of the conjunctiva (" washing "), and acropachy (morbus Marie) of which six cases, not all of tuberculosis origin, are described in the Netherlands by WINSSER. In one case we (W) observed a dog with a severe hæmothorax; at autopsy, besides other tuberculous lesions, erosion of a blood vessel by a specific lesion proved to be the cause of the severe hemorrhage. I think every practitioner can add his own particular cases.

In clinically suspected cases of tuberculosis, besides attempts to demonstrate the causative agent in exudates or tissue sections, a tuberculin test may be performed. In the Netherlands, the subcutaneous test is still the method of choice but I agree that the results are not always exact

and sometimes confusing. LESBOUYRIES advises the use of tuberculin prepared from canine and feline strains of tubercle bacilli. KIRK recommends, only in dogs, the ophthalmic test. TEUNISSEN thinks the cutaneous method (Pirquet) to be better than the intradermal test (Mantoux), although the latter is to be preferred in man.

As dogs and cats, in cases of tuberculosis, may spread enormous numbers of bacilli by coughing, in the faeces (primary tuberculosis of the intestines or by ingested sputum), in the urine or in secretion products of fistulae, skin ulcers and conjunctiva, it is an important task for the members of the profession to diagnose the disease as early as possible and to inform the owner (consent for destroying the animal) as well as the family doctor.

VERLINDE has published a study of tuberculosis of dogs and cats in the Netherlands and, whereas I observed in my practice at Leyden an increase in frequency of tuberculosis in small animals, he did the same at autopsy (animals from Leyden and Amsterdam); on the other hand, SCHORNAGLE (Utrecht) observed at autopsy a decrease in the frequency of tuberculosis during the war years :

	Examinations:				Cases of tuberculosis:			
	Schornagel		Verlinde		Schornagel		Verlinde	
	dogs	cats	dogs	cats	dogs	cats	dogs	cats
1940	200	106	—	—	3	2	—	—
1941	154	98	—	—	1	4	—	—
1942	193	125	109	27	3	3	1	0
1943	281	131	107	36	2	1	0	1
1944	218	121	112	28	1	0	4	9

The percentage of cases of tuberculosis in cats, in VERLINDE's figures for the year 1944, is 32; there is no doubt that a certain selection of autopsy material is responsible for this unusually high incidence but I must agree, from my own clinical observations in practice, that the frequency of tuberculosis, particularly in cats in Leyden, increased considerably in 1944. It is supposed that the cat, an animal that hardly adapts itself to uncommon food, suffered more from malnutrition than the dog but to our mind it was easier to support life in cats by minimal amounts of food, than in dogs. The cat still received its small ration of milk and we consider the non-pasteurised, non-boiled (no gas, no electricity, no fuel) milk to have been the main source of infection. A second source of infection in both dogs and cats was the meat offal from the black market. On the other hand, we observed some cases in which the human being, suffering from open tuberculosis of the lungs, infected his dog. In tuberculosis of dog, cat and man mutual infections occur, the more so as the human being is also susceptible to infections with the bovine type of tubercle bacillus (DE RAADT and VAN DER HOEDEN).

VERLINDE has published some interesting details of cases of tuberculosis in dogs and cats. In seven dogs: No. 1, with a food-borne infection (tuberculosis of the mesenteric lymph glands, peritonitis, specific foci in spleen, liver, kidneys and some small ones in the lungs) was bought from a farmer who possessed some cows, suffering from tuberculosis. The bovine type was isolated from the dog. No. 2, a dog, sleeping in bed with a girl suffering from tuberculosis of the lungs, showed at autopsy a severe tuberculous bronchopneumonia, specific foci in the mediastinum, spleen, liver and kidneys. From this case, which was considered as an aerogenic infection, the human type could be isolated. No. 4 concerned an air-borne infection in a dog which was fed with the scraps of a neighbouring family of which a member was suffering from tuberculosis (type of bacillus unknown). The bovine type could be isolated from dog No. 5, the pet of a person suffering from open tuberculosis of the lungs. The dog's autopsy showed an aerogenic type of infection from which human tubercle bacilli could be isolated. From 14 cases of tuberculosis in cats, all the bovine type, published by VERLINDE, we mention No. 1, an animal with tuberculosis of the mesenteric lymph glands; a child of the family was suffering from abdominal tuberculosis and a joint infection with contaminated milk is supposed. No. 8, a cat with tuberculosis pleurisy; the animal always resided in the room of a woman suffering from lupus vulgaris, which disease, it is said, could be caused in a high percentage by the bovine type of tubercle bacillus. Infection of the cat by the patient is more probable than the reverse.

In one case, concerning myself, a professional infection was observed: on the top of the left little finger a small ulcer, covered by a crust, was detected. The pus under the crust consisted mainly of lymphocytes; bacteria could not be demonstrated. An enlargement of the lgl. cubitales and lgl. axillares of the left arm appeared, combined with general weakness, enlargement of the spleen and subfebrile temperatures in the evening. Pus, sucked from the lgl. axillares, proved to be bacteriologically sterile; nevertheless the disease was considered as tuberculosis. X-ray treatment of the swollen lymph glands, combined with rest and extra rations (wartime!) brought recovery within half a year. There was strong evidence that a dog in my practice, suspected of suffering from tuberculosis, was the cause of the infection but this animal disappeared out of my sphere and could not be traced.

Leptospirosis

In leptospirosis, an important disease in men and dogs in the Netherlands, three types of leptospira have been described, occurring in Holland: the classical strain, the canicola strain and the *grippo-typhosa*. Much work has been done in our country by SCHUFFNER, KLARENBEEK and others; the only reason for not mentioning here the names of the English authors, who have provided excellent articles on this subject, is that there are too many.

I observed particularly in the summer months of 1941 an epidemic of predominantly *L. canicola* infections in dogs and wondered why this infection is still a rare disease in man. May it be that a canicola infection in man is not always recognised, as the clinical picture may resemble an influenza-like disease ? Canicola fever has been demonstrated in man: BRUNO & associates, CHAPINS & JEQUIER, GSELL & KANTER, KOLOCHINE & COLOMBIER, MEYER & associates, MOLNER & co-workers, ROSENBAUM, SENEKJE and others. DHONT *et al.* stress the critical evaluation of serological tests in leptospirosis. In a case of a rather severe leptospirosis without jaundice the serum titre took an unexpected course. On the 6th day of illness no antibodies could be demonstrated; on the 11th day, however, the titre was 1:30 and 1:30,000 to the classical and the canicola strain respectively ; a canicola infection was suspected, but on the 27th day of illness the titre to the classical strain was raised to 1 : 30,000 and the titre to the canicola strain came only to 1 : 10,000. *L. icterohaemorrhagiae* could be isolated from the patient's blood. on the sixth day of illness, by inoculation of guinea-pigs (we observed in a dog a similar high non-specific co-agglutination and an absorption test was necessary to identify the etiology). In one case only did DHONT and co-workers succeed in proving a real canicola infection in a human case by isolation and identification of a leptospira strain from the patient's urine. ROOS could isolate *L. canicola* from a patient's urine as well as from the urine of the patient's dog. ROOS and

associates have described a canicola infection in a kennel. From 26 persons, who had been in contact with some of the dogs, only one felt seriously ill, 2 others showing only a mild influenza-like disease. *L.canicola* could be isolated from the urine of the first patient but all three persons showed a high titre to the canicola strain, whereas the antibody titre to the classical strain was absent or low.

SCHUFFNER and associates state that up to 1934 only six cases of canicola infection in man were recognised in the Netherlands but MINKENHOF mentions 49 human cases, diagnosed from 1933 to 1948 in the Institute for Tropical Hygiene at Amsterdam. Of these, six, with one fatal case, showed jaundice.

The clinical picture of the canicola infection in the dog, as observed in the 1941 epidemic (WINSSER) is often rather vague and in young dogs, in the initial phase, it may be confused with distemper. Besides general symptoms of weakness, anorexia and vomiting, a severe apathy was striking. Albuminuria was always present. Jaundice could not be observed, although experimental canicola infections in puppies regularly showed icterus (KLARENBEEK and WINSSER). Congestion and injection of the conjunctivae and sclerae may be absent; on the other hand, these signs may be present in conjunctivitis, endometritis, and other diseases. Myalgia (stiff walk) frequently occurs. Neurological symptoms (fits) could be observed in some cases. In two cases loss of hair was pronounced. Antibodies to leptospirae could be demonstrated in new-born dogs: the serum titre of the bitch on the day of delivery came to 1 : 1,000 (classical strain) and 1 : 30,000 (canicola strain) respectively, and of a puppy, nine hours after birth, 1 : 100 (cl. strain), and 1 : 3,000 (can. strain). A second puppy showed, 4½ days after birth, a titre of 1 : 1,000 to the canicola strain only ; three months after birth antibodies could no longer be demonstrated. We were also able to demonstrate antibodies (only lysines) in the milk of the bitch.

We made no attempts to isolate leptospira (wartime!); the guinea-pig is not very susceptible to the canicola strain but the hamster is said to be susceptible for both the classical and the canicola strain.

Salmonellosis

Our attention has been drawn to salmonellosis in dogs by the fact that we (WINSSER and VAN OOSTROM) were able to isolate *S. dublin* from the blood of a two-years-old dog, showing fever, anorexia and obstipation. Recovery was uneventful. The serum titre to the identified strain, estimated a fortnight after the isolation, was 1 : 1600 and that of a companion dog, which never showed any symptoms of illness, 1 : 200. We failed to isolate salmonella from the urine and the faeces of the dogs. Both had been fed with offal of a slaughterhouse, but the exact source could not be traced.

Salmonella infections seem to occur rather frequently in dogs (less frequently in cats). The infection may take a " silent " course, with (or without) merely symptoms of fever and some general malaise, but the animal may also show a severe gastro-enteritis. An infected bitch may infect its puppies and whole litters may succumb.

The infected dog, during the disease and the convalescence also, may, as a (transient) carrier, spread salmonella organisms in the urine and the faeces, and we know that every strain of salmonella, without exception, may be a potential danger for human health. Even *S. pullorum* is not quite harmless for man!

In eighteen outbreaks of enteritis in dogs, in which whole litters died, BRUNER and EDWARDS succeeded in isolating four strains: *S. typhi-murium, S. cholerasuis* (causes in man a primary septicaemia with a high mortality), *S. anatum* and *S. newport*. *S. anatum*, a known pathogen for man, has been isolated more than once in dogs (CRAIGE, SELIGMANN *et al.*) STAFSETH and associates report a septicaemic litter infection caused by *S. cholerasuis*. *S. typhimurium* has been isolated many times from dogs: VERGE (two dogs with bronchopneumonia), PYLE (from the spleens of dogs, suffering from distemper), SHIRLAW (dogs in India). NEWMAN isolated *S. give* from a dog with an enteritis, DOLMAN *S. bredeney* from a case of canine septicemia. CASTELO isolated *S. newington* (canine septicaemia) and SELIGMANN and associates *S. panama*. WOLFF and associates collected rectal swabs from 101 dogs and made attempts to isolate salmonella. From thirty-eight dogs with distemper, five examples (*S. typhimurium, S. manhattan, S. newport, S. minnesota*) were reported; from eight dogs with gastro-enteritis *S. oranienburg* could be isolated only in one case. From twenty-eight normal dogs none could be isolated. From twenty-seven dogs of a private kennel affected by septicaemia, distemper or enteritis, salmonella (*S. minnesota, S. bredeney, S. oranienburg, S. worthington, S. kentucky, S. cubana, S. cerro, S. meleagridis*) were isolated in 13 cases, and on repeated examinations different strains could be identified or a faeces specimen proved to be negative at one time and positive at another. Because of this inconsistency it was thought that contaminated food or drink was the source of this temporary carrier state.

Scandinavian workers reported some interesting cases, relating to human infections. KAUFMANN and HENNINGSEN isolated *S. glostrup* from the faeces of seven members of a family suffering from gastro-enteritis, as well as from the blood of the family dog; a simultaneous infection of both man and dog is accepted. *S. paratyphi B* has been isolated by CASPERSEN from a paratyphoid outbreak in six persons, the diseased dog being strongly suspected as the source of infection. MAGNUSSON described a human outbreak, caused by *S. abortus canis*, which type was isolated for the first time by GARD.

In our country, VAN DORSSEN was able to cause enteritis in puppies by feeding them with *S. enteritidis* var. *dublin*.

REITLER, in Palestine, described a peculiar outbreak of a possible tick-borne disease among dogs, from which a new type of salmonella could be isolated.

Only a few references are given on cats : *S. cholera suis* (EDWARDS & BRUNER), *S. paratyphi A* from a case of pyometra (MERA), *S. typhi murium* (WOLLENWEBER and associates); in the Netherlands, VAN DORSSEN, isolated *S. typhi murium* (the most frequent strain in cats) from a number of young cats.

Among pigeons salmonellosis is rather common, *S. typhi murium* frequently being isolated (in our country : CLARENBERG & DORNICK, VAN DORSSEN. The latter isolated *S. dublin* in one case).

Streptococcosis

Streptococcosis is a not uncommon infection in dogs and cats, in England as well as in the Netherlands. Confusion still exists concerning the pathogenicity of strains of streptococci, isolated from animals, to man but there is strong evidence that, *e.g.*, the milk-borne " sore throat " epidemics in man are caused by streptococci, residing in the cow's udder, but possibly of human origin. VERLINDE, WINSSER & KRET described five fatal cases of streptococcal infections in dogs. Most cases, including a bitch and five puppies, showed the symptoms of haemorrhagic septicaemia, jaundice, swelling of the spleen and, at autopsy, multiple foci of necrosis in the liver. In four cases *B*-haemo-

lytic streptococci could be isolated from blood and organs, in one case only from small abscesses in the lungs. Finally, haemolytic streptococci could be isolated from the kidneys of a dog with uraemia (subacute interstitial nephritis). BUTAYE, in Belgium, has published some excellent papers on the serological and biochemical identification of streptococci, isolated from dogs suffering from impetigo, metritis and other purulent processes and as most strains belonged to the human streptococcus types, he stresses the possibility of mutual infections between man and dogs.

Brucellosis

No striking new points of view concerning brucellosis in dogs and cats have appeared in the literature of the last decade. I agree with VAN DER HOEDEN that brucellosis is perhaps a rather common infection in dogs. This, as a rule inapparent, infection in dogs gives rise to specific agglutinins and complement fixing antibodies; VAN DER HOEDEN could demonstrate agglutinins in 16.3% of 442 sera taken from dogs at random and in one case a brucella strain could be isolated from the blood. THOMSEN, in Denmark, could demonstrate specific antibodies only in dogs living in the country and not in dogs living in Copenhagen.

In some cases clinical symptoms and signs of disease are reported, *e.g.*, metritis, abortus (VAN SACEGHEM) and orchitis.

Very little is known about spontaneous brucellosis in cats although this animal species is susceptible to experimental infections

Parasitic Skin Diseases

May it be that, *e.g.*, canine and feline scabies are frequent in man ? More important, owing to their stubborn character are the parasitic skin diseases produced by fungi.

We must distinguish between the human microsporum infection *(M. audouini)* not transmissible to animals and rather frequent in children, and animal microsporum infections (*M. canis*), more common in cats than in dogs and communicable to man. Cats are often carriers, without or with only minimal skin lesions and it may be difficult, even for skilled members of the profession, to demonstrate the presence of the fungus. I observed a stubborn infection in a cattery of Persian cats, in which some adult persons had contracted the disease.

Some animal strains of the genus Microsporum are capable of causing a favus-like picture in man (scutula on the naked skin). *M. gypseum* occurs in dogs, *M. quinckeanum* in cats, particularly on the paws and the nose as the cat contracts the disease from mice, which are also able to infect man directly. The human being is susceptible, also, to *M. gallinae* (white comb of fowls).

The genuine favus of man, caused by *M. schoenleinii*, is infectious only for children. Adults are very resistant but a child which has contracted this dermatomycosis, when not cured, may become a carrier till his death and so an old grandmother with a chronic, inapparent favus, acquired in her youth, may infect her grandchildren.

Trichophytia is also not a rare disease in dogs *(T. caninum)* and cats *(T. felineum)*. In man, we must distinguish a superficial form (ringworm on the skin, tinea capitis on the scalp) and a deep form (sycosis barbae) with suppuration, leaving an immunity after healing. Most superficial forms of the naked skin in man are caused by animal fungi.

Toxoplasmosis

There is strong evidence that toxoplasmosis is widespread in man as well as in animals all over the world. The first case published in the literature attracted attention by the severe form occurring in infants and taking a fatal course. We now learn from serological tests (SABIN & FELDMANN's dye test) that not only mild forms occur in which the patient may survive with or without defects, but that inapparent infections are somewhat common. We could isolate a strain of toxoplasma from the cerebrospinal fluid of a living infant (WINSSER and associates) and performed a number of serological tests from which we learned, partly in co-operation with BINKHORST, that the disease must be widespread in man in the Netherlands, and as toxoplasma has a wide host range, the disease must occur in animals, too, mutual infections being possible*. No investigations are made in this field in the Netherlands but many cases of toxoplasmosis are described in dogs (MELLO, CARINI, YAKIMOFF, BLAND, BOEZ, NICOLAU & KOPCIOWSKA, MACCHATTIE, OLAFSON & MONLUX, BLANC & HINTERMANN) and only a few in cats (OLAFSON & MONLUX, CHATTON & BLANC).

Dr. Trevan kindly provided us with tissue sections of the brain of a dog which, after a slight illness of about a fortnight, showed convulsions and died within 24 hours, and those of a heart muscle of a young dog which showed, during life, diarrhoea, bronchopneumonia, impaired eyesight and spastic paralysis of the limbs. In both tissue sections we could find, as Dr. Trevan indicated, characteristic toxoplasma pseudocysts.

Predominant clinical features in toxoplasmosis of carnivores are bronchopneumonia and/or enteritis with enlarged spleen and liver.

Echinococcosis

The history of echinococcosis in the Netherlands is very interesting by reason of the distribution of the disease among the inhabitants of the different provinces, the frequency with which it is met in the slaughter animals as well as in dogs (autopsy findings of *Taenia echinococcus*) and the frequency of the cysts in man and animals and those of the tapeworm concerned in dogs in times of peace and war.

Before the 2nd World War the incidence of echinococcosis was highest in the province of Friesland. SNAPPER has made interesting studies on the disease in man as TENHAEFF and FERWERDA did in animals. In Friesland draught- and yard-dogs were rather common, the former being fed with garbage of the export-slaughterhouses and the latter with offal of the home-slaughterings. Of course, many dogs were infested with *T. echinococcus* and it may be because the parasite's life is somewhat short (VAN AMERONGEN thinks, however, at least five months), reinfections were common. The draught-dog, particularly, spread its infectious faeces through the country and contributed to the circulation of the parasites in man and animals. Direct contact between dog and man is not the only means of contracting the disease, contamination of vegetables and fruits with dog's faeces may be enough. The worm eggs are very resistant and may keep fertile for at least a year

The meat inspection regulations have diminished the prevalence of the disease and we see a continuous decrease

* SABIN writes: "Because the dog is one of the commonest domestic animals, its possible rôle as a transmitter of toxoplasma to human beings must receive careful attention in the future."

of the number of human cases in the Netherlands : 1911-1915 63 cases, 1932-1936 31 cases and 1937-41 18 cases.

In the post-war years the incidence of echinococcus cysts in slaughter animals has increased considerably, *e.g.*, in horses in the province of Gelderland from 1.7% in 1945 to 3.27% in 1946; only the incidence in sheep remained constant. This increase induced VAN AMERONGEN to trace the sources of infestation. Infected pigs which are slaughtered as a rule in their first year of life, can be traced more easily than adult horses and cows, which, in the course of their life, may have more chances of becoming infected from different sources in different parts of the country. The results were alarming. VAN AMERONGEN traced 133 suspected dogs of which 107 could be destroyed. Autopsy was performed in 98 dogs (as the worm eggs of the different tapeworms are alike, it is only possible to make a correct diagnosis during the dog's life by demonstrating the proglottides in the faeces, as in EICHHOLTZ's case). The dog has to be fasted 24 hours before destruction and autopsy has to be performed within one hour after death. Predilection sites are the posterior part of the duodenum and the beginning of the jejunum. VAN AMERONGEN demonstrated the presence of from one to numerous specimens of *T. echinococcus* in 43 dogs. One tapeworm, being self-fertilising, is enough for progeny.

According to VAN AMERONGEN the reason for such an increase in frequency of the *T. echinococcus* in the dog and the cysts in the slaughter animals may be a result of war circumstances. The German soldiers often brought with them dogs, coming from Eastern parts of Europe, and these animals, frequently harbouring tapeworms, contaminated our live-stock. Of course, the clandestine slaughterings on the black market have fostered the spread of the parasites.

In man, the results of these heavy infestations in dogs, cannot yet be stated as, in adults, the clinical manifestations of a contamination with the eggs of *T. echinococcus* do not as a rule become apparent within 5-10 years, dependent on the site of the cysts. The younger the individual, however, the quicker the clinical symptoms will develop as, *e.g.*, was the case in a 17-months-old baby.

Ornithosis

In 1940 PINKERTON and SWANK isolated a strain of psittacosis virus from young pigeons, differing from the classical psittacosis virus strains isolated from psittacideae, in virulence for man and animals. All strains isolated from pigeons (COLES in S. Africa, ANDREWES & MILLS & HUGHES in England) and other non-psittacine birds proved to be less virulent for mice when inoculated intra-cerebrally, less virulent for man (pigeon-fanciers, laboratory workers) and lethal for pigeons when inoculated intra-cerebrally. MEYER termed all strains isolated from non-psittacine birds ornithosis virus, but to our mind, making this difference may not be in the interest of public health in the Netherlands as the Dutch official regulations concerning the control of communicable diseases deal only with "psittacosis".

WINSSER and associates were able to isolate for the first time an ornithosis strain from pigeons in the Netherlands. Complement fixation tests, performed by DEKKING (who succeeded in isolating a second strain from pigeons) indicated that psittacosis (ornithosis) must be widespread among pigeons in the Netherlands, particularly among homing pigeons. DEKKING observed some cases of a typical pneumonia in pigeon fanciers and members of their families; both human beings and their pigeons showed positive complement fixation tests with psittacosis antigen but DEKKING failed to isolate a virus strain from the sputum of the patients.

References

Tuberculosis : BEKKER, Verslagen Tuberculose Studiecommissie, 1943. BONNET, THIEFFRY & MONTEFIORE, *C.r.Soc.Biol.* 1938. BRADBURY & YOUNG, *Lancet*, 1946. CONTI, *La Nuova Vet.* 1932. DANBOLT & BRANDT, *Arch. Derm. Syph., Wien.* 1938. DOBSON, *J. comp. Path.* 1930. FELDMAN, *J. Amer. vet. med. Ass.* 1930, 1934; *Annals of N.Y. Acad. Sc.* 1947; FELDMAN, DAVIES, MOSES & ANDBERG, *Amer. Rev. Tuberc.* 1943; GRIFFITH, Roy. Comm. Tuberculosis 1907; *Vet. J.* 1924; *J. comp. Path.* 1926, 1928. HJARRE, *Acta Tub. Scand.* 1939. HÜBSCHMANN, Pathologische Anatomie der Tuberkulose, Berlin 1928. INNES, *Vet. J.* 1940. JENSEN, LESTER & TOLDERLUND, *Acta Tub. Scand.* 1940. KIRK, Index of Diagnosis 1947. KUWABARA, *Kitasato Arch.* 1938. LESBOUYRIES, *Rec. med. vét.* 1925, *N. Amer. Vet.* 1926. LOVELL & WHITE, *Brit. J. Tuberc.* 1940. NIEBERLE, *Ergeb. Path. Anat.* 1931, 1932, *Arch. Tierheilk* 1937. PLUM, *Maaned. f. Dyrl.* 1936. RABINOWITSCH-KEMPNER, *Z. Tuberk.* 1921. SUTTER, Tumorartige tuberkulöse Granulomatose. Diss. Basel 1948. STABLEFORTH, *J. comp. Path.* 1929. TEUNISSEN, *Tijdschr. Diergeneesk.* 1948. VAN GOIDSENHOVEN & SCHOENAERS, *Ann. med. vét.* 1939, 1940-41. VAN DER HOEDEN, Verslagen Tuberculose Studiecommissie 1937; *Tijdschr. Diergeneesk.* 1937; VAN DER HOEDEN & DE RAADT, *Ned. Tijdschr. Geneesk.* 1940. VERGE, *Rev. Path. Comp.* 1945; VERGE & SENTHILLE, *Rec. med. vét.* 1942. VERLINDE, ANTONIE VAN LEEUWENHOEK 1939; Verslagen Tuberculose Studiecomm. 1948. WINSSER, *Tijdschr. Diergeneesk.* 1946.

Leptospirosis : BRAMMER, BORG PETERSEN & SCHEEL-THOMSEN. *C. r. Soc. Biol.* 1938. BRUNO, WILEN & SNAVELY, *J. Amer. vet. med. Ass.* 1944. CHAPUIS & JEQUIER-DOGE, *J. Suisse de Med.* 1946. DHONT, KLARENBEEK, SCHÜFFNER & VOET, *Ned. Tijdschr. Geneesk.* 1934. GSELL & KANTER, *Schweiz. med. Wschr.* 1945. KLARENBEEK, Acta Conventus III de Tropicus Atque Malariae Marbis 1938. *Tierärtzl. Rdsch.* 1931. IIIrd Internat. Congress comp. Path. Athens 1936. *Zbl. Bakt.* 1938. *Wien. Tierärtzl. Wschr.* 1938. KLARENBEEK & SCHUFFNER, *Ned. Tijdschr. Geneesk.* 1933, 1938. KLARENBEEK & WINSSER, *Dtsch. tierärtzl. Wschr.* 1937. KOLOCHINE-ERBER & COLOMBIER, *C. r. Soc. Biol.* 1945. MEYER, EDDY & ANDERSON-STEWART, *Proc. Soc. exp. Biol.* 1938. MINKENHOF, *Ned. Tijdschr. Geneesk.* 1947, *Lancet* 1948. MOLNER, MEYER & HASKIN, *J. Amer. vet. med. Ass.* 1948. ROOS, *Ned. Tijdschr. Geneesk.* 1937. ROOS, WALCH-SORGDRAGER & SCHUFFNER, *Ned. Tijdschr. Geneesk.* 1937. ROSENBAUM. *Arch. int. Med.* 1946. SCHÜFFNER, *Tr. Roy. Soc. Trop. Med. Hyg.* 1934. SCHÜFFNER, KOTTER & SCHULTZ, *Geneesk. Tijdschr. Ned. Ind.* 1935. SCHÜFFNER, & WALCH-SORGDRAGER, Bull. mens. Office internat. h'Hyg. publ. 1937. SENEKJE, *J. Amer. med. Ass.* 1944. WALCH-SORGDRAGER, Bull. Health Organ. League of Nations 1939. Les Leptospiroses. Bull. Org. Hyg. Soc. Nat. 1939. WINSSER, *Z. InfektKr. Haustiere* 1943.

Salmonellosis : BRUNER & EDWARDS. *Proc. Lth Annual Meeting U.S. Livestock Sanitary Ass.* 1946. BRUNER & JOYCE, *Amer. J. Hyg.* 1947. CASPERSEN, *Förh. norsk. med. Selsk.* 1937. CASTELO & SALSAMENDI, An. Fac. Vet. Montevideo 1938. CLARENBURG & DOORNICKX, *Ned. Tijdschr. Geneesk.* 1932. DOLMAN, *Canad. Publ. Health J.* 1943. EDWARDS & BRUNER, *J. Inf. Dis.* 1943. GARD, *Z. InfektKr.* 1938. KAUFFMANN & HENNINGSEN, Acta path. microbiol. scand. 1939. MAGNUSSON, *Z. InfektKr.* 1938. MERA, *Rev. Med. Vét.* Buenos Aires 1941. NEWMAN, cited by Wolff. Reitler & Menzel, *Trans. R. Soc. trop. Med. Hyg.* 1946 SELIGMANN, SAPHRA & WASSERMANN, *J. Immunol.* 1946, *Amer. J. Hyg.* 1943. SHIRLAW, MACDONALD & HAYES, *Indian Vet. J.* 1946. STAFSETH, NEW & SHOLL *M.S.C. Vet.* 1944. VAN DORSSEN, *Tijdschr. Diergeneesk.* 1936, *Arch. Tierhlk.* 1936. *Z. Veterinärk.* 1937. WINSSER & VAN OOSTROM, *Tijdschr. Diergeneesk.* 1948. WOLFF, *J. Amer. vet. med. Ass.* 1947. WOLFF, HENDERSON & MCCALLUM, *Amer. J. Publ. Health* 1948. WOLLENWEBER, WUSTENBERG & KÖNIG, *Zbl. Bakt.* 1937.

Streptococcosis : BUTAYE, *Vlaam. Dierg. Tijdschr.* 1945. 1946 VERLINDE, WINSSER, KRET, *Tijdschr. Diergeneesk.* 1947.

Brucellosis : THOMSEN, *Medlemsbl. danske Dyrlaegforen* 1932. VAN DER HOEDEN, De Zoönosen, Leyden 1946, *Tijdschr Diergeneesk.* 1932. VAN SACEGHEM, *C. r. Soc. Biol.* 1927.

Dermatomycosis : Duncan, *Min. Hlth. Month. Bull.* 1945. Hoerlein, *Cornell Vet.* 1945. *Jadassohn's Manuel* Band 14 nr. 1 (Heller : Die Klinik der nichtigsten Tierdermatosen.)
Toxoplasmosis : Mello, *Bull. Soc. Path. exot.* 1910. Carini & Maciel, *Bull. Soc. Path. exot.* 1911. Yakimoff & Kohl-Yakimoff, *Bull. Soc. Path. exot.* 1911. Blanc, *Bull. Soc. Path. exot.* 1917. Boeh, *C. r. Soc. Biol.* 1921. Nicolau & Kopciowska, *Bull. Soc. Path. exot.* 1935. Machattie, *Trans. Roy Soc. Trop. Med.* 1938/9. Ray & Raghavachari, *Indian J. Vet. Sci.* 1941. Olafson & Monlux, *Cornell Vet.* 1942. Blanc & Hintermann, *Maroc med.* 1948. Winsser and associates, *Prof. Soc. exp. Biol. N.Y.* 1948. *Tijdschr. Diergeneesk.* 1948.
Echinococcosis : Bergsma, *Tijdschr. Diergeneesk.* 1947. Eichholtz, *Ned. Tijdschr. Geneesk.* 1942. Tenhaeff & Ferwerda, *Tijdschr. Diergeneesk.* 1935, 1936. III Congr. Int. Path. Comp. 1936. Van Amerongen, *Tijdschr. Diergeneesk.* 1947.
Ornithosis : Andrewes & Mills, *Lancet*, 1943. Dekking, to be published. Hughes, *J. comp. Med.* 1947. Meyer, *Medicine*, 1942. Viral and Rickettsial infections of man, edited by T. M. Rivers, 1948. Pinkerton & Swank, *Proc. Soc. exp. Biol. N.Y.*, 1940. Winsser, Anthony van Leeuwenhoek 1949. Winsser, Dekking & Stol, *Tijdschr. Diergeneesk.* 1949.
General : Van der Hoeden, De Zoönosen, Leyden, 1946.

. . . . . .

Discussion

The first opener of the discussion was Mr. Alex. Thomson, M.R.C.V.S., of Glasgow, who said: I would like first of all to convey through Dr. Peters my congratulations to Dr. Winsser on the excellent paper which he has prepared, and to thank you, Dr. Peters, for being present in his absence to present it.

One of the questions frequently asked of the small-animal practitioner is, "Will it be infectious to the children?" and I often feel that the answer I give is fraught with moral risk. It is therefore right that the true position, in the light of new knowledge, should be reviewed from time to time.

Dr. Winsser's observations on tuberculosis serve to emphasise the variable factors necessary in any area to produce high incidence of the disease in dogs and cats. This is particularly noticeable in the cat, wherein infection of the bovine type is the commoner. This was noted also by A. R. Jennings with reference to cats in Liverpool.

In the County of Cheshire the incidence of bovine tuberculosis in humans was two per 100,000 in urban areas and 16 per 100,000 in rural areas, and the highest incidence in Scotland of bovine pulmonary tuberculosis in man—9 per cent.—was likewise found in a predominantly rural area in the North-East: indicating again the method of infection and the necessity of pasteurisation of all milk not obtained from tubercle-free cattle.

That the disease is not readily transmitted from the dog or the cat to man is again reassuring, and is in line with my own experience and indicates that steady improvement in Public Health measures is likely to reduce the incidence in time.

In Glasgow, where the occurrence of human tuberculosis is fairly high, and in fact was rising during the period, I have not noticed more than an odd case in the dog in the last ten years, and fewer cats than I have suspected have proved positive on investigation. The number of tuberculous milk samples in the city has shown a steady drop in the same period. No cases of infection from dog or cat to man have been recorded by the M.O.H.

The early symptoms in the dog or cat are not clear cut and it is only in the last resort that I am led to suspect tuberculosis.

The young cat with yellowish diarrhoea, thin, and obviously unthrifty, or the dropsical cat with palpable glands are the most suspicious. I would say that the coughing dog rarely falls under suspicion until other signs are fairly well advanced.

Tuberculin tests are not sufficiently reliable to be of much real help.

Accidental infection of man from superficial tuberculous foci or fistulae is a possibility.

Much work has been done of recent years on leptospirosis. That *L. canicola* is widespread among dogs is accepted. McIntyre and Stuart[2] have recently reviewed the condition as it occurs in Edinburgh, and Glasgow has a similar picture. The influenza complex is, I am sure, sometimes blamed for what may be transient illness in humans due to *L. canicola.*

Angstien[3] reports cases in California in 1943 and Gardner[4] in *The Lancet* cites two cases supporting the view that a type other than that found on the Continent is present in Britain, *viz.*, L. 3260. Within the last week I have knowledge of a case in which a veterinary surgeon in Stirlingshire who was bitten by a dog subsequently proved to be suffering from leptospirosis.

Dr. Winsser certainly has not clarified the symptoms for the clinician; any more confusion in the distemper syndrome it is hardly possible to imagine. McIntyre and Stuart stress what is probably the most salient symptom—thirst and depression in the young dog.

Of *L. icterohemorrhagiae* 14 cases are recorded as having occurred in Glasgow from 1940-49, all among fish workers or tripe cleaners. However, in these circumstances, of course, any illness with jaundice would lead to fuller investigation. Mild cases may be missed where the history is not significant.

I have no evidence that would lead one to suppose that streptococci are readily transmissible or intercommunicable from dog or cat to man. The cow is still considered to be a factor in the spread of septic sore throat due to *S. epidemicus*, but not of scarlet fever, and although our knowledge of the streptococci has been increased it is still far from complete.

Brucellosis in man is, I am sure, often overlooked and much more investigation is necessary. Many practitioners know of instances and I myself can think of several where it was never thought of as a possible cause of the illness.

Of the parasitic skin diseases, sarcoptic mange and ringworm are not very common in my practice (follicular mange is very common). I know of two instances of sarcopt transmission from dogs. In one case several children and the mother were affected. In the other a man developed scabies of the chest. Quite recently three children in one family were affected with ringworm. There was a concurrent clinical condition in the dog, and in the cat, although showing no visible signs, fluorescence was obtained to small areas under ultra violet with a Wood's glass filter. One case of fungoid disease in a man, affecting his foot, came to my notice a few years ago. The cat in the house was affected with a skin condition which we failed to type. The owner had a habit of rubbing the cat with his bare foot.

Of Echinococcosis much might be said. In Australia Dew[5] considers that one in 300 hospital admissions are due to hydatid disease. It is accepted that it may go unrecognised for years, often being picked up in childhood and trapped in the liver until pressure symptoms are produced, or the cyst may rupture, producing multiple spread. Reports are difficult to obtain as it is not a notifiable disease in this country. I have seen one case in the Glasgow Royal Infirmary where the patient had no history of contact with dogs. Echinococcal cysts found in Glasgow abattoir numbered 33 during the last three months out of 155 cysts found. Although not exactly relevant to household animals, it might be of interest to note, following the article by McLean of Belfast, that from July, 1948, to date 591 cases of *cystericercus bovis* were found, representing 1 per cent. of cattle slaughtered in Glasgow.

Salmonella infection is undoubtedly serious, many small outbreaks going unrecognised. It is significant that of recent years new strains have been found in Britain attributable to the introduction of American spray-dried eggs. *S. dublin* in cattle has been reported in S. Wales. The acid condition of the stomach of dogs has been said to be inhibitory to the growth of salmonellae and it is of some moment to note, in Dr. Winsser's paper, yet another cause of enteritis in dogs with possible spread to man.

Another of the influenza syndrome conditions is psittacosis and although it is recognised that overcrowding of birds is necessary to produce the explosive epidemics, the question of endemic infection in local aviaries giving rise to odd cases of atypical pneumonia in man must not be overlooked. That ornithosis has been found to be widespread in homing pigeons is of more than passing interest.

Rabies is fortunately controlled by the sanitary laws of quarantine in this country, but quite a few of our soldiers on foreign service were subjected to the painful prophylactic measures following dog bites because of the neglect to maintain the dog alive to confirm the diagnosis, and in several instances were quite ill. I know of one man who developed an encephalitis.

In gas gangrene, anthrax, actinomycosis and tetanus, although not in the true sense communicable diseases, the possibility of direct inoculation by bites must be borne in mind. It is recorded[7] that a baby contracted acute tetanus from pigeon droppings, dying in 48 hours. One pigeon was found to be excreting the bacilli.

Of diphtheria there is still conflicting evidence. Simmons reports two cases in cats and Litterer quoted by Hull[7] cites the fowl as being a harbourer of the organism and capable of transmitting the disease to man.

It would appear that diseases transmitted from animals—and particularly the household animals—to man are fortunately still limited in most instances to single infections, except where a group of persons might be infected from a common source as in food poisoning, or ringworm from a cat.

The changing character of disease factors—not least, perhaps, new methods of controlling old conditions—modern methods of transport and new sources of food, may alter the picture from time to time. Disease records from all available sources would appear to be necessary to get a true picture not only of the economic importance of diseases but their possible effects on man.

Dr. Winsser's contribution to our knowledge is both timely and valuable.

References

1 Jennings, A. R. (1949.) "The distribution of tuberculous lesions in the cat and dog." *Vet. Rec.* **61.** 380-384.
2 McIntyre, W. I., & Stuart, R. D. (1949.) "Canine leptospirosis." *Ibid.* **61.** 411-414.
3 Angstein, L. (1943.) "Leptospirosis in man and animals." *Vet. Med.* 359-360.
4 Garner, A. (1943.) *Lancet.* **245.** 157-158.
5 Rock Carling & Paterson Ross. *British Surgical Practice.* **5.** 46-60.
6 Abbott, S. G. Private Communication.
7 Hull, T. G. (1941.) Diseases transmitted from animals to man. 334-339.

Mr. H. Williams Smith, M.Sc. (Wales), B.Sc. (Lond.), Ph.D. (Lond.), M.R.C.V.S., Dip. Bact. (Lond.), formerly of the London School of Hygiene and Tropical Medicine, who was the second opener of the discussion, said: First, I should like to thank Dr. Winsser for giving us such an excellent contribution on a subject which concerns both the small-animal practitioner and the public health worker. I wish to confine my remarks to the possibility of household animals serving as reservoirs of salmonella infection for man. Dr. Winsser has given a very good review of salmonella infections of cats and dogs. I would, however, like to refer to a very recent paper by Bruner and Moran (1949) which has only just become available. This paper gives an account of 2,788 strains of salmonellae isolated from 32 animal species, other than man or fowls, examined at the Kentucky Experiment Station over a period of 16 years. The majority of these cultures were from pigs, but dogs, with 103 strains, came as high as second on the list with regard to the number of cultures examined. Thirty-four cultures were also studied from cats. These cultures from household animals usually belonged to species of salmonellae which are quite commonly implicated in outbreaks of food poisoning in man.

Many of the salmonellae examined by Bruner and Moran and by other workers have been isolated from sick animals and, consequently, they do not give a true picture of the extent to which household animals may serve as a reservoir of infection. Furthermore, a symptomless carrier is probably a greater danger from the public health aspect than the animal which is clinically ill. In view of this, Professor J. C. Cruickshank and I decided to carry out a survey to determine the frequency with which salmonellae could be isolated from the faeces of healthy cats and dogs. Our findings have been fully described in a paper which is, at the moment, in the process of publication. From 500 specimens of canine faeces, five salmonellae were isolated, a frequency of 1·0 per cent. These were *Salm. typhi-murium* (two specimens), *Salm. newport* (two specimens) and a salmonella which could not be fully identified but which was probably *Salm. dublin*. From 500 faeces samples from healthy cats, seven salmonellae were isolated, a frequency of 1·4 per cent. These were *Salm. typhi-murium* (three specimens), *Salm. anatum* (two specimens), *Salm. montevideo* and *Salm. paratyphi B*. A number of faeces samples from pigeons were also examined. Three out of 133 samples were found to contain salmonellae (2·25 per cent.), all of which were *Salm. typhi-murium*. It is interesting that all the salmonellae that were isolated in this survey belonged to species which cause disease in man.

To get an impression of the extent to which household animals may act as reservoirs of infection, one can compare our results with those recorded for rats and mice which are recognised as an important source of salmonellae of food poisoning types. A comparable survey of these animals has been carried out by Welch, Ostrolenk and Bartram (1941) in America. They isolated salmonellae from 1·2 per cent. of 420 samples of rat or mouse faeces. Thus it is probable that the percentage of salmonella excreters among household animals is something of the same order as in rats and mice.

Dr. Winsser has mentioned three human outbreaks of salmonella infection which have been traced to dogs as the probable source. There are also a few examples in the literature of cats being associated with human infection. For instance, Kauffmann and Henningsen (1938) isolated *Salm. braenderup* from the faeces of a man suffering from enteritis and from his cat which had died of a diarrhoeal type of illness. Taylor (Wilson & Miles, 1946) identified *Salm. concord* from a case of gastro-enteritis in a child and from her cat. Taylor (1949) has also reported the infection of a child with *Salm. typhi-murium* from her cat. I think there is sufficient evidence to date to warrant one drawing a few conclusions. First, I think household animals should always be considered as possible sources when outbreaks of salmonella infection in man are being investigated. Secondly, I believe that these animals should not be allowed free access to unprotected food. I mention this particularly in regard to cats as, although I realise their great value in the destruction of vermin, I see no justification for permitting them complete freedom to wander about amongst uncovered food in shop windows, a custom common enough in the country, and one which must fill our guests from abroad with horror.

References

Bruner, D. W., & Moran, A. B. (1949.) *Cornell Vet.* **39.** 53.
Kauffmann, F., & Henningsen, E. J. (1938.) *Z. Hyg. InfektKr.* **120.** 640.
Taylor, Joan. (1949.) *Proc. R. Soc. Med.* **42.** 219.
Welch, H., Ostrolenk, K. M., & Bartram, M. T. (1941.) *Amer. J. publ. Hlth.* **31.** 332.
Wilson, G. S., & Miles, A. A. (1946.) *Principles of Bacteriology and Immunity.* 3rd Edition. Arnold, London. Pp. 733.

Mr. L. K. Whitten (Head of the Section of Parasitology, Animal Research Station, Wallaceville, New Zealand): I wish to refer to one of the diseases mentioned in the paper which is very important in New Zealand, namely, hydatid disease. In New Zealand this disease is a very serious problem both in man and in animals. The classical home of the disease is Iceland, but its modern homes are South America, Australia and New Zealand. In New Zealand, which has a population of 1¾ millions, about 100 cases of hydatid disease are recorded each year and of this number an average of 12 are fatal. Some ten years ago, legislation was passed to help reduce the incidence of the disease. Now all dog owners on registering their dogs must buy sufficient arecoline to eliminate tapeworm infestation from their dogs. An educational campaign has also been conducted to spread information about the facts of the disease and its control, emphasising equally the need for regular dosing of dogs and the proper disposal of infected offal.

A study of the value of arecoline hydrobromide has been carried out and has confirmed the very high efficiency of this drug. It is important that adequate purgation should occur, for the action of the drug is due not to lethal action on the worm, but to a temporary paralysis, and unless the worms are swept out of the gut in that stage, recovery and reattachment may occur. The results have not been spectacular. It has been impracticable to supervise the dosing of the dogs and therefore many dogs have not been dosed at all; some have been dosed too infrequently and others dosed inefficiently. In New Zealand there are no wild animals which can serve as hosts for the tapeworm, although wild goats may play some part. The prophylaxis requires constant supervision, and one infected liver eaten by a dog may give rise to thousands of worms. A hydatid cyst grows slowly, and a cyst appearing to-day might be the result of an infection acquired five years ago. Therefore, no sudden reduction in the incidence of the disease in man can be expected, but the position could be improved greatly by using methods of

education in the means of control, the principles of which have been at our disposal for many years.

General Discussion

The Chairman said that they could congratulate Dr. Winsser on having stated the case so succinctly. This was a very important subject to the profession. The world expected veterinary surgeons to do their share, and more than their share, in keeping down infections of animals, and so did the medical profession. One point which was worth emphasising in the discussion was the need to educate the public and go on educating them. The ignorance of even well-educated people on this question was simply astounding and that applied in most countries. Propaganda must be maintained. As a member of the Mycology Committee of the Medical Research Council he had been astonished to hear the extent to which ringworm infection of children occurred as a result of contact with small animals.

Dr. Margrit Scheitlin (Zurich) referred to microsporum infections in Switzerland. From the end of last summer until the winter she had seen many new cases in dogs. Batches of such cases appeared at the same time and there was a short interval of from one to three days before the next batch. In the recovered animal one attack could produce an immunity from the disease. As the animal microsporum had mainly a great inflammatory effect (the same had been found in humans) she found a few days after the first signs, *symptoms of acne*. She was not certain whether the pus formation was of primary or secondary origin. There had been a number of cases in which children and even adults had been infected and got patches on their arms or face. She added that vitamin F in high doses, given by the mouth, and in the form of ointments, was of very great value in microsporum infections.

Dr. L. E. Cameron (Canada): In the paper scabies of cats and dogs had been mentioned. He wondered if anyone had seen a progressive sarcoptic scabies definitely as an infection from a small animal. In his experience with bovine sarcopts he had tried experimentally to transmit it to other animals—horses, sheep, rabbits, rats, dogs and cats, and incidentally himself—without any success in getting it to stay.

Miss J. O. Joshua (London): They had heard a good deal about diseases which were transmissible from animals to man, but it seemed to her that at a meeting of this type it might be desirable to emphasise the other aspect, namely, the very limited number of diseases which were transmissible, particularly in this country. Several of the speakers had spoken of the decrease in tuberculosis in small animals in this country, a view with which she agreed; this decrease appeared to be consistent with the increase in pasteurisation of milk. Leptospirosis had a public health significance, as had been mentioned in other sessions.

The possible importance of transmission between man and animals of the Salmonella organisms had been discussed at several of the sessions and undoubtedly merited attention. Echinococcosis, which was a major problem in some countries, was of little significance in Great Britain.

The question of other intestinal parasites had not received much attention, but it was a common experience for small-animal practitioners to be told by their clients that their children had contracted worms from the dog or cat. Sometimes this had been suggested to the persons concerned by laymen, but occasionally also by their medical advisers. On challenging the species concerned it was invariably found that the parasites were not those carried by small animals and she thought members of the veterinary profession had a duty to the public in pointing out how rarely was the suggested source of infection possible.

With regard to skin diseases, the importance of ringworm had been underlined, and she considered that the diagnosis of ringworm in any member of a household should call for the most careful examination of all household pets—particularly cats, since these were often symptomless carriers of *Microsporon*, especially the Blue Persian. So far as sarcoptic mange was concerned, there appeared to be tremendous individual variation in the susceptibility of man to animal infection. Many veterinary surgeons engaged in small-animal practice had had a long clinical career without ever having acquired the infection; others, on the other hand, could not handle a sarcopt case without acquiring a mild infection. This was usually confined to the forearms and occasionally thighs; it appeared to be virtually self-limiting and either cleared up without treatment or responded to a single dressing of some simple application such as sulphur ointment. She thought it should be pointed out that these parasites were to some extent host-specific and therefore while they might infest people for a short time, prolonged infestation was unlikely. The same was true of fleas and lice.

One skin parasite which could infest cats and rabbits without causing symptoms was *Cheyletiella parasativorax*; this parasite could be transmitted to man giving rise to an acute pruritus, usually on the upper arms and chest. The condition in man was not serious.

In conclusion, she would like to stress again the very limited number of diseases which was transmissible when one considered the close contact between household pets and their owners.

Miss Olga Uvarov (Ewell, Surrey): During the last 15 years she had encountered seven cases of sarcoptic mange in the owner of a small animal. Six of these cases were in women and one was in a child. She thought the greater prevalence of this condition in women was due to the fact that women had a more sensitive skin, that they washed more frequently than men, and that they handled dogs much more. All these cases started with pustules on the inner aspect of the arm and then spread as irritating patches on the scapula. They were most unpleasant to look at. She had also seen one case of ringworm in the human transmitted by an animal, and she had seen two cases of tuberculosis in dogs when the owner also had tuberculosis.

She wished to put in a plea for the number of cats which had been blamed for transmitting diseases like ringworm, or so-called "diphtheria." Often veterinary surgeons were asked to destroy animals of this kind. Only very recently a cat was brought to her with the plea that it should be painlessly destroyed because it had infected the entire family with ringworm. The animal was examined and no ringworm was found, and on examining the family it was evident that the infection was derived from a human source.

Dr. P. L. le Roux (Department of Parasitology, London School of Hygiene and Tropical Medicine): It was rather a shock to hear some of the speakers mention that there seemed to be so few diseases in this country communicable from household animals to man. That might be so in this country, but if the whole world were taken the list was a formidable one. He thought that certain helminths of animals did play a part in exposing man to tuberculosis. Textbooks on bacteriology made no mention of larval helminths migrating through the lungs and so predisposing the individual to tuberculous invasion. It must be remembered that the larval stages of certain ascarids of the dog and cat could reach the lungs of man and provoke pneumonia.

He disagreed with Dr. Winsser's remark that a single specimen of *T. echinococcus* could produce fertile eggs. Another larval tapeworm infestation seen in man was *Coenurus cerebralis* in the spinal cord. Concerning the amount of cysticercosis bovis, this was said to be seriously on the increase in this country. It was not generally realised that the eggs and the segments did not necessarily reach the outside in the human stool. The segments did migrate actively from the rectum at any time of the day. His purpose in speaking was rather to take exception to the remark that few parasites could be transmitted from household animals to man. He felt that man could harbour a large number of animal parasites and that these, directly or indirectly, did provoke serious discomfort and ill-health at times.

Dr. A. W. Stableforth (Weybridge): Dr. Winsser had stated that there was some confusion regarding the possibility of infection with streptococci from animals to man. There might be some complexity but, he submitted, no confusion. It was known that cows could be infected by Group A streptococci from a human source and the milk could then cause an epidemic of scarlet fever or sore throat. The ordinary mastitis streptococcus (Group B) might cause infection of the human throat, as had been found in a number of cases with people who had drunk raw milk, but it rarely caused disease. The Group C streptococci which were common in the horse and might appear in dogs and cows, were distinct from the Group C streptococci which caused trouble in human beings. Groups G and L also were common in dogs but were not common human pathogens. It did not therefore seem likely that human disease often arose from infections in animals with these or other groups of streptococci, except Group A.

Dr. Winsser had said that Butaye in Belgium had found many strains of human type in dogs and cats. At the Royal Veterinary College in London they examined some 60 strains from these sources ten years ago and did not find a single strain of Group A and only one or two strains of Group C which might possibly carry the infection to human beings.

Mr. T. L. Wright: He had only one or two instances to bring forward which suggested some lines of thought on the communicability of disease from animals to man. Only during the previous week a case had come under his notice of a woman and her daughter; the latter had mastoid disease at the beginning of the year, but this had been overcome. Following this they were advised to drink nothing but T.T. milk from a special herd. Therefore

this mother and daughter gave up the daily household milk and during that year had had special milk from a T.T. herd, but just recently the mother had developed infection with Bang's bacillus, and the presumption was that the source of the infection was this special milk which had not been pasteurised.

Many years ago he had a cat brought to him for treatment. On examining it he found the cat had a diphtheritic throat and sent a message to the owner telling him that the cat should be left with him and that it should be destroyed. When he took the cat in his arms the animal bit him and on dropping it it bit him again. Within three hours his hand became swollen and black. He went to a well-known bacteriologist—that was in the early days of autogenous-vaccination—and asked him if he could obtain some material so that he might prepare a vaccine for him in case of need. Mr. Wright forgot to mention that he suspected that the cat had diphtheria. In the meantime he used continuous fomentations on his hand and the swelling went down and he felt more comfortable. On going back to the bacteriologist he found him somewhat puzzled. He said that he had had difficulty in getting much material from the punctures. The only organisms he could find were those of diphtheria in an attenuated state. The interesting point was that although infection in the wounds had caused severe local inflammation, there were no resultant signs of any infection in the throat.

Dr. R. F. Montgomerie (President, N.V.M.A.): He could not allow this session to end without acknowledging the compliment which had been paid to the Association by this paper which had been presented to them. After Dr. Winsser undertook to prepare a paper they had a message to say that he had been called up to the Army and that soon he would have to go to Indonesia. It was quite remarkable, as illustrating his interest in the subject and his readiness to help, that in spite of this emergency Dr. Winsser found the time between his call-up and his departure for Indonesia to produce this very excellent paper. Many others had paid them a compliment at that conference but he thought this was quite exceptional and was worthy of special remark. As he could not present the paper himself Dr. Winsser had chosen the right man to present it and they were also much obliged to Dr. Peters.

Since he read the paper and while listening to the discussion he had sometimes wondered whether the title might not be better the other way round, "Diseases of Man Communicable to Animals"—whether there was not a greater risk to the animal than to the man. The glass shields in the Zoological Gardens were not put up to protect the visitors against the animals but to protect the animals against the visitors!

The Reply

Mr. Joh. C. Peters, in reply to the discussion, said that many interesting facts had been put forward, but it would take up too much time to go over them all. In Holland before the war they had few cases of echinococcosis in cattle or sheep, but, as Dr. Winsser had stated in his paper, during the occupation many of the German soldiers brought with them dogs which harboured the tapeworm concerned (*T. echinococcus*). That had now, however, been cleared up.

Only careful meat inspection, including home-slaughterings, could prevent the contamination of dogs and in this way combat the risk for human beings. It was not practicable to examine all dogs or to worm them, owing to the difficulty of finding the very small proglottides in the faeces. For the same reason—the size of the tapeworm—efficacious control of the anthelminthic cure was almost impossible.

As for scabies, he thought the danger to man was not so very great. He saw a good many cats and dogs infected with sarcopts and occasionally among those who handled them a number of pustules might make their appearance. If, however, the affected person did not scratch them, the pustules often healed spontaneously in a day or two. Human dermatologists had told him that they only gave anti-pruritic treatment, because the mites did not multiply in man. They considered it as an allergic skin reaction, as with the pustules, containing no mites, seen in human scabies.

Mr. Peters still thought that the number of cases communicable to man was rather small, and that it was not very difficult in most cases to avoid communicability, provided that professional advice was asked in time and proper precautions were taken not only in definite cases but in suspected cases also.

Once the diagnosis was made, the risk generally was small; certainly it was so if compared with that during the time previous to the examination.

LAMENESS IN THE BOVINE*

By

G. W. SEARLES, M.R.C.V.S.,

Alresford, Hants

Owing to the vastness of the subject these notes can only be scanty, dwelling perhaps in more detail on those lamenesses that are familiar to me, and on those about which I know little and wish to know more, such as those of the hip.

Lameness is the manifestation in one or more limbs, in the act of progression, of pain, weakness, inability or impediment of the limb.

Causes

I group these under three headings:—

1. Of Traumatic Origin (accidental).
2. Of Bacterial or Virus Origin.
3. Systemic Diseases with lameness as a symptom.

Under lamenesses of traumatic origin I refer to foot injuries from stones, flints, nails, tree stubs, etc.

Fractures, partial or complete, fall into three groups:—

(*a*) Those resulting from activities during oestrus and coitus.

(*b*) Those arising from badly planned modern cow houses.

(*c*) Those due to natural hazards in meadows, rabbit holes, dells, ruts, etc.

In addition, of course, there are other miscellaneous causes.

These groups occur to me, as each produces its own type of lameness, for example:—

Group (*a*).—Injuries caused during oestrus most commonly produce lameness in the upper limb and usually the upper part of the limb, *i.e.*, shoulder or just below, due as we all know to the animal (male or female) that has mounted falling off sideways. This may produce fractures, or muscle or tendon strains. Again, during these activities I frequently find an injury to the hip.

Group (*b*).—I have in mind smooth and slippery floors, badly planned mangers and gutters, narrow doors, exits and entrances with angular instead of rounded brick work. Lameness from this cause may be due to any part of the limb becoming injured.

Group (*c*).—Cause lameness due to injuries of the lower parts of the limb—fractures and strains from rabbit holes, ditches, ruts and so on.

My second main cause I grouped as bacterial or virus in origin. This covers lameness due to foot-and-mouth virus, *B. necrophorus* (foul in the foot), joint-ill (staph.-strep.), mud fever (mixed infection).

My third group covers symptoms arising from transit fever, laminitis and diseases, such as rickets, caused by mineral deficiencies.

Age and Its Relation to Lameness

The adult bovine, that is two years and over, most commonly is subject to lameness for two very obvious reasons: (1) The bones have become calcified; (2) At this age there is movement several times a day in and out of cow houses and milking parlours and in many instances travelling on hard rough surfaced roads which drive flints into the sole of the foot.

Between the ages of six months to two years is, I suggest, a period very free from lameness.

* Communication made in opening discussion of this subject at the January, 1949, meeting of the Central Veterinary Society.

From birth to six months one encounters lameness from malnutrition and congenital deformities and infections.

Diagnosis

First obtain a history of your case from the owner or attendant, primarily to find out if it is an individual case, or if the condition affects many animals. Having made up your mind on this point, forget all you have been told and proceed to diagnose for yourself, so that you may not be misled. Taking the case where only one subject is affected, if the animal is lying down at the time of your visit, get it to rise as naturally as possible (not to be "frightened up"); not only should this give a good opportunity of spotting the affected limb, but it can give a very useful hint: I refer to whether it rises on the knees, which is normal, or places the forelegs out and rises similarly to the equine. If in this latter manner, you can proceed to find your cause in one or both knees. It may be a fracture of one of the carpal bones, though it is due most commonly to bruising of the synovial joint capsule and bursae.

Again, during rising one may hear crepitus.

Next get your patient to walk, taking careful note how it turns on leaving the box or stall. Personally, I make my examination from the foot upwards, so whilst the animal is moving I note carefully the manner in which the foot meets the ground, *i.e.*, whether the pressure is even on both claws, or on the toes or heels only, or is greater on one claw than the other. In the case of injury in one claw the gait may be very misleading and give one the impression that the shoulder or stifle regions may be the site of injury, due to a swinging (outward or inward) action of the leg. In fact this action enables the animal to place its weight on the sound claw. Should pressure be even on both claws, with this swinging action I should expect to find the main cause higher than the knee (this does not absolve one from also examining the feet).

Having selected the claw, proceed to examine; in my cases I use first a light hammer. Tap the sound claw first until the subject is used to the hammering sensation and then transfer to the suspect claw and note quality of flinch. Tap with the same weight all over; in the case of a foreign body, or pus in the foot the flinch will be most noticeable at the affected spot.

Do not wash the foot before searching; I am of the opinion that thorns, cuts, flints and nails are easier to see in dry horn.

Should the flinch be the same all over the foot I would suspect injury of the pedal bone or coronary joint: eliminate by rotating the claw.

Foul-in-the-foot or "lure" can be found between the claws. Mud fever and cracked heels, in such weather as this, may produce lameness in one or more feet.

Where all four feet are affected I would suspect systemic disease, such as foot lesions in foot-and-mouth, found round the coronet or where the horn joins soft tissue, or laminitis or coronitis due to dietetic disturbance or travel. In such cases I think the heat of the feet is sometimes of importance.

This covers very scantily the diagnosis of foot lameness.

Between the hoof and knee I think diagnosis usually is obvious, the conditions met with being either fractures, sprain of the fetlock joint due to injury, or in the case of young calves, joint-ill, or rickets. I do feel good use of the X-ray could be made, to confirm the nature of the bone injury. It is most uncommon, in my experience, to see tendon strain or an injury in this part of the limb in the bovine (*i.e.*, I seldom resort to bandaging or blister).

The knee and hock are not commonly the site of serious lameness. When it does occur in these parts it is usually attributable to faulty standings causing pressure on the joints. On several occasions I have met with a lameness which shows itself in the hock, yet is due to torn muscles, which have insertions on the tuber calcis; this results in complete inability to extend the limb, the hock dropping to the ground. It occurs as a sequel to recumbency, *e.g.*, following milk fever.

Shoulder lameness is easier to diagnose in the bovine than in the equine. As stated earlier, it frequently results during coitus. The scapula may be found to be fractured at the neck, or there may be partial displacement of the scapulo-humeral joint. The limb is held stiffly, appears to be shortened and can bear no weight. At times one meets a case in which the attachment of the shoulder to the thorax is ruptured. During movement the shoulder joint and upper limb rotate outwards and leave the body. It is simple to diagnose.

The hip joint is a very common seat of injury. Frequently it is quite difficult to diagnose the exact cause and even more difficult to give a prognosis. During movement there is difficulty in advancing the limb, which may swing outwards—frequently termed swinging leg lameness. The stride is short, the limb held stiff and the toe dragged. If due to one or more fractures in the pelvic region, crepitus may be easily heard, either by swaying the hind quarter, or by moving the limb; crepitus may readily be felt by placing a hand over the hip joint during these movements. Locating the exact fracture is not, in my opinion, nearly as simple.

The sites of fracture that may be met with are as follows:—

1. External angle of the ilium (pinbone knocked down). The degree of displacement is very variable. Can be easily seen or felt and, other than shortening of the step, it is not a harmful condition.

2. Shaft of the ilium. This may be suspected externally by alternate pressure with right- and left-hand on the angle of the haunch and tuber ischii. Next get an assistant to exert these pressures whilst you yourself examine rectally. I suggest that even then it may not be possible to confirm.

3. Shaft of pubis and ischium. Similar steps should be taken for diagnosis.

4. Tuber ischii. This should be diagnosed easily and is not of serious consequence.

5. Pubic symphysis. Quite frequent, the animal's hind quarters sway as though the limbs were attached only at the hip joint. May be confirmed by rectal examination. In severe cases the patient is grounded with the hind limbs doing "splits." Here prognosis is grave.

6. Involving the cotyloid cavity. Lameness is much more marked than in any of the foregoing and weight cannot be taken by the foot. The shallowness of the acetabulum permits of dislocation more easily than in the equine. The displacement is most commonly upwards and backwards. It can be complicated by rupture of the joint capsule or the cartilaginous rim, by fracture of the osseous rim, or even the cotyloid cavity, but how to diagnose the exact state I do not know and therefore find it extremely difficult to prognose. It is here I hope to gain knowledge during discussion.

Diagnosis of lameness due to causes two and three, when all four limbs are affected, should be arrived at by searching enquiries into feeding and change of feed, change of habits, *e.g.*, travel, or from dung-yard to concrete, etc., climatic conditions and so on.

Treatment

I can deal only briefly with this important aspect of my subject.

When the horny part of the foot is involved, linseed meal poultices are most effective for softening and healing. Remove foreign bodies.

Lure or foul-in-the-foot can be cured more rapidly in

these days by the intravenous injection of soluble sulphapyridine.

The layman still makes great use of Stockholm tar in foot cases, hardening the horn and shutting infection in, thus aggravating the case. I feel it should be as difficult to procure as a new car.

Sulphanilamide internally in all cases showing a rise in temperature is of great value in the bovine.

Most fractures of the lower limb, *i.e.*, below hock and knee, can be mastered by gypsona plaster cast, possibly with some additional support in the older animal.

In the past, fractures above the hock and knee have been regarded as hopeless, whereas in the near future I shall hope to see curative measures taken, such as pinning. The increased value of the milking animal now warrants the expenditure of more time and money on its recovery.

In cases affecting the shoulder and hip, knee and hock the treatment is Asquithian—wait and see.

In cases under causes two and three, having made a diagnosis, the treatment is specific, *i.e.*, antidotal.

It is impossible to do justice to such a subject in the time available and I only hope these few jottings will make a basis for useful discussion.

Discussion

Mr. Barton, in opening the discussion, emphasised the anatomical differences between the bovine and equine foot, and expressed the view that nursing was of paramount importance in the cure of many bovine lamenesses. Among lamenesses due to injury he dealt more particularly with hygroma of the knee, describing his method of treatment by seton, or in smaller ones on the hock by incision. Referring to injuries to the foot and punctured wounds generally, Mr. Barton expressed the view that poulticing was contra-indicated, owing to its damage to the tissues. Proceeding to "foul-in-the-foot," he enlarged on Mr. Searles' description of the symptoms and results of treatment with soluble sulphonamides, which he considered of great value, except in cases where the joint-capsule is infected, these cases being susceptible only to amputation of the digit, the technique of the operation for which he proceeded to describe along conventional lines. Mr. Barton also mentioned an interdigital dermatitis as a common cause of lameness, specially in bulls, the only remedy being surgical removal.

Mr. Mitchell also spoke of lameness in the bull caused by neglect of the feet and stated that his treatment for hygroma was to open aseptically and immobilise the joint in a plaster cast. He also described his technique for intravenous injection, with the needle pointing *towards* the heart.

Mr. McLauchlan was of the opinion that faulty construction of cowsheds was a major causal factor in bovine lameness, which view was supported by Mr. Hulse, who cited cases of strained flexor tendons due to cows' feet slipping into the gutter. He also considered that some lameness due to arthritic conditions was caused by *Br. abortus*.

Dr. Le Roux thought onchocerciasis more common in this country than had been suspected, and that certain larval nematodes might transmit causal bacteria in some joint and tendon infections through the skin. He also cited a form of paralysis, believed to be hereditary, as a cause of lameness in the hind quarters.

Mr. Bruford agreed with and emphasised points made by previous speakers.

Another contributor stated that he had used penicillin successfully in stubborn cases of foul-in-the-foot. Mr. Langford did not consider luxation of the perforatus tendon to be hopeless.

Professor McCunn mentioned epiphyseal fractures, stating that most recovered with rest and a C.L.O. diet. He considered vitamin A and D deficiency to be a predisposing cause of arthritis in the hock seen when cattle are shedded after a dry summer. He also commented on techniques of intravenous injection, on cleanliness, on shoulder lameness, and on the rôle played in the causation of bovine lameness by long walks on the road to and from pastures.

CLINICAL COMMUNICATION

THE TREATMENT OF SARCOPTIC MANGE IN PIGS WITH BENZENE HEXACHLORIDE

F. C. ALEXANDER, M.R.C.V.S.,
Cannock

Introduction.—An indication of the acaricidal properties of benzene hexachloride was first reported by Taylor[1]. It was successfully used against sarcoptic mange in dogs by Lewis[2], camels by Draz[3] and in chorioptic mange of the horse by Steward[4]. Its effect against psoroptic scab of sheep was recorded by Downing[5].

This report describes its effect on the sarcoptic mite of pigs.

History.—An outbreak of sarcoptic mange occurred in a large commercial piggery. The pigs were kept under free range conditions; segregation of the breeding stock from young pigs and stores was effected by electric wire. Corrugated iron hutments provided shelter in each paddock. The animals were fed on an inadequate allowance of meal, compensated by a generous distribution of "processed pudding" which, unfortunately, appeared to be of doubtful feeding value. The outbreak of sarcoptic mange occurred in both paddocks, and was well established by the time treatment was commenced. The diagnosis was confirmed by the microscopic examination of skin scrapings, using a sugar flotation method, and the sarcopt was readily demonstrable.

Symptoms.—The highest incidence, with the most severe symptoms, was evident in pigs of eight to 16 weeks. The early stages of the disease were associated with marked scab formation, the skin later becoming thickened and thrown into folds. Pruritus was intense, resulting in a general restlessness, accompanied by a rapid loss in condition. Two small pigs of eight to ten weeks died after becoming severely debilitated by the disease.

Treatment.—Using a benzene hexachloride wettable powder type formulation, 50 gallons of the acaricidal wash was prepared at a strength of 0·125 per cent. benzene hexachloride.* The young pigs were individually immersed in this wash, while the larger pigs were scrubbed. An effort was made to brush the scabs off the affected animals, in order to assist the penetration of the dressing. After a single treatment a rapid improvement was apparent, pruritus ceased, and the pigs commenced to improve in condition. This continued until after three to four weeks all animals approached the normal age weight ratio. The treatment was repeated after an interval of 14 days to effect the destruction of young larvae subsequently hatching after the first immersion.

Bedding from the hutments was burned and the walls washed with the acaricidal wash at the same strength as was used for the animals. However, in view of the weak powers of survival of the sarcopts when separated from the host, attention to disinfestation was not emphasised. Attention was directed towards improving the diet, with the addition of minerals, etc.

Since the completion of this report, my attention has been drawn to a report published in *Veterinary Medicine*. **43.** 10 (1948), in which 0·9 per cent. B.H.C. suspension applied as a single spray, effected a complete control of sarcoptic mange in pigs.

* Benzene hexachloride used contained approximately 12½ per cent. γ-isomer so that the equivalent γ-isomer concentration was 0·0186 per cent.

Summary

Two applications of a wash containing 0·125 per cent. benzene hexachloride eradicated sarcoptic mange in a commercial piggery. Dipping and scrubbing were used in this case, but it is probable that spraying would be equally efficient.

Acknowledgments.—The benzene hexachloride wettable powder was prepared by Cooper, McDougall & Robertson, Ltd. I acknowledge gratefully the advice of Mr. D. W. Jolly, M.R.C.V.S. (Cooper Technical Bureau), with regard to the uses of the benzene hexachloride.

References

1 Taylor, E. L. (1945.) *Vet. Rec.* **57.** 210-1.
2 Lewis, E. F. (1946.) *Ibid.* **58.** 159.
3 Draz. (1947.) *Ibid.* **59.** 542-9.
4 Steward, J. S. (1946.) *Nature.* **158.** 636-7.
5 Downing, W. (1947.) *Vet. Rec.* **59.** 581-2.

ABSTRACTS

[Studies on Calves Experimentally Infected with *Cooperia punctata* (*v.* Linstow, 1907) Ransom, 1907. Bailey, W. S. (1949.) *Amer. J. vet. Res.* **10.** 119–129.]

Experiments with eleven calves artificially infected with *Cooperia punctata* have added to our knowledge of the life history, pathogenicity and pathology of this parasite. The prepatent period varied between eleven and 16 days, no relationship being exhibited between the age of the animal and the period. The patent period of the infection may be as long as nine months but was consistently shortened by repeated exposure of the host to infective larvae due, it appears, to the result of an active immunity developed by the host. In calves up to twelve months of age no evidence of a protective age resistance was produced. After initial and repeated exposures to infective larvae there was first an accumulation of a parasite load and then a self-cure, which resulted in the expulsion of the worms, and in seven calves, which harboured the parasite for as long as three months, an active immunity developed sufficient to protect the animals against significant reinfection or superimposed infection even when very large numbers of larvae were given as test doses. There was some evidence that the suppression of egg production by the female worms is one of the first manifestations of a developing resistance of the host. The parasite is considered to be pathogenic, but only one calf showed significant clinical symptoms of infection; these included diarrhoea, anorexia, dehydration, and progressive emaciation leading to death. Although it has been stated that *Cooperia* sucks blood and, in heavy infections, produces a more marked anaemia than is seen in trichostrongylosis, the author failed to find evidence of anaemia in any of the infected calves. Gross lesions were mainly confined to the duodenum, consisting of a catarrhal inflammation with a fine, lace-like fibrino-necrotic exudate, haemorrhages and a thickening of the intestinal wall. Histologically, the mucosa and submucosa, particularly the latter, showed a leucocytic and serous infiltration. There was an extensive fragmentation of the epithelium of the mucosa. The parasites were mainly found in contact with the surface of the gut wall, although in one calf they had penetrated to the submucosa and serosa of the upper part of the intestine.

J. N. O.

[The Anthelmintic Efficiency of Phenothiazine Sulphoxide against *Oesophagostomum columbianum* in Sheep. Gordon, H. McL. (1948.) *Aust. Vet. J.* **24.** 335–336.]

Two experiments are described which show that phenothiazine and phenothiazine sulphoxide have a similar anthelmintic efficiency against *Oesophagostomum columbianum* in sheep. Although a number of derivatives and related compounds of phenothiazine have been tested for anthelmintic efficiency, the sulphoxide is the first to be found which is effective against *Oe. columbianum* and, at the same time, possesses low toxicity for the host. It has the same disadvantages as phenothiazine, *viz.*, difficulties in administration owing to the large dose required, the relative insolubility, and the fleece-staining qualities of the drug.

S. J.

NEWS FROM OVERSEAS

Australia

United Kingdom scientists visiting Australia for the international specialist conference on agricultural subjects showed keen interest in important research work upon animal health which is being carried out in Melbourne.

The investigations are being conducted at the Animal Health Laboratories of the Commonwealth Scientific and Industrial Research Organisation at Parkville. Three delegates who spent some days investigating the work were Dr. H. H. Green, D.Sc. (Glas.), D.Sc. (H.C. S. Africa), of the Veterinary Laboratory, Weybridge, Ministry of Agriculture and Fisheries; Dr. James Stewart, M.A., Ph.D., D.Sc., F.R.S.E., Animal Diseases Research Association, Moredun Research Institute, Scotland; and Dr. J. W. Howie, M.D., head of the pathology department, Rowett Research Institute, Bucksburn, Aberdeenshire, Scotland.

They were conducted on a tour of the laboratories by the chief of the Division of Animal Health and Production, Dr. L. B. Bull, and the principal research officer, Mr. T. S. Gregory.

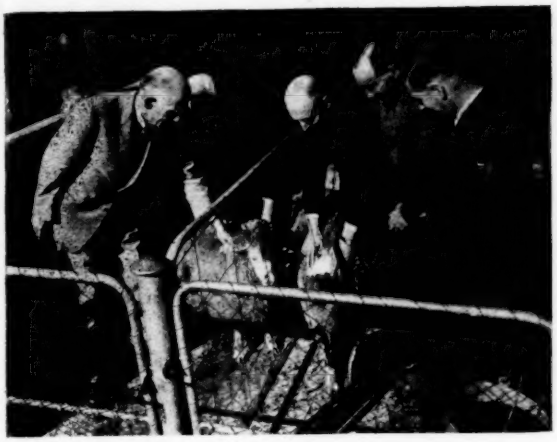
A considerable amount of the general work of the Division is carried on in conjunction with other laboratories, with field stations, and with various State departments of agriculture. At Parkville the visiting scientists saw data on the results of an experiment to determine the nutritional stresses on the maintenance of immunity against pleuropneumonia in cattle. The laboratories sent 314,000 doses of its vaccine to centres in the northern State of Queensland, and to the Northern Territory for the year 1947. The work is still going on.

The laboratories' work on tuberculosis is directed towards finding a practical application of the tuberculin test to cattle which are heavily infected with the disease but which do not react to the normal test.

Keen interest was shown in the work on sheep, including experiments to determine the protective value of annual vaccination one month before shearing, as a protection against caseous lymphadenitis.

The visitors inspected sheep in the yards of the laboratories, and were informed of the results of researches into toxaemic jaundice. It has been shown that severe outbreaks of the disease have occurred under early and high rainfall conditions in the States of Victoria and New South Wales, soil acidity providing conditions favourable to the occurrence of the disease.

Dr. H. H. Green stated that he was very impressed with the work of the laboratories, particularly as it was associated broadly with similar research work at Weybridge.



(With acknowledgments to the Australian News and Information Bureau.)

Inspecting sheep in the pens at the Laboratories where extensive research work on toxaemic jaundice and other diseases in sheep has been successfully carried out—from left: Dr. H. H. Green, Dr. L. B. Bull, chief of the Animal Health Laboratories, Mr. T. S. Gregory, principal research officer, Dr. J. Stewart and Dr. J. W. Howie.

Dr. Stewart was also interested in the chemical laboratory work, and Dr. Howie stated that the delegates were looking forward to visiting the experimental herds of the Division at Werribee. He said that the Australian officers were to be complimented on the wide scope of the general investigations which were of importance to the agricultural industry in all countries.

. . . . . .

U.S.A.

President-elect of the American Veterinary Medical Association is Dr. W. M. Coffee, whose practice covers parts of four States. He has been a member of the A.V.M.A. for 30 years, a member of the Kentucky State Board of Agriculture for 12 years, and was recently appointed a trustee of of the University of Kentucky.

. . . . . .

Mexico

An outbreak of bat-transmitted rabies among cattle on the west coast of Mexico, where it has existed unrecognised for a number of years, has recently been reported.

Infection is conveyed exclusively by vampire or fruit-eating bats. Cattle are mainly sufferers from this disease; it is much less common in horses and human beings.

There are many grasslands in northern South America where cattle can be grazed only if vaccinated annually against rabies. The mortality from rabies in at least one infected herd in Mexico has ranged from 20 to 50 per cent.

Vampire bats—*Desmodus rufus*—have been discovered inhabiting a cave only 300 miles from the Rio Grande.

(*Vet. Med.* Sept., 1949.)

WEEKLY WISDOM

General interest in all forms of horsemanship is more widespread and intelligent than some prophets, looking not long ago into the future of this increasingly mechanised age, believed to be probable.—The Times.

NOTES AND NEWS

Diary of Events

Oct. 22nd.—Meeting of the North of Scotland Division, N.V.M.A., at Inverness (Drumossie Hotel), 2.30 p.m.

Oct. 22nd.—Meeting of the Biochemical Society at King's College, Strand, 2 p.m.

Oct. 26th.—Meeting of the Lancashire Division, N.V.M.A., at Manchester (Grand Hotel, Aytoun Street), 2.30 p.m.

Oct. 27th.—Meeting of the South Eastern Division, N.V.M.A., at Maidstone (Royal Star Hotel), 2.30 p.m.

Oct. 27th.—Meeting of the West of Scotland Division, N.V.M.A., Clinical Club, in the Veterinary School, Glasgow, 7.30 p.m.

Oct. 28th.—Meeting of the Welsh Branch, N.V.M.A., at Newtown (The Bear Hotel), 2 p.m.

Oct. 28th.—Meeting of the Sussex Division, N.V.M.A., at Brighton (The Old Ship Hotel), 2.30 p.m.

Oct. 31st.—Commencement (in London) of R.C.V.S. Animal Management Examination.

Nov. 4th.—R.C.V.S. Pharmacology Examination (written).

Nov. 4th.—Meeting of the Yorkshire Division, Hotel Metropole, Leeds, at 2.30 p.m.

Nov. 5th.—Annual General Meeting of the Society of Women Veterinary Surgeons, at the Royal Veterinary College, Camden Town, N.W.1, 2 p.m.

Nov. 7th.—R.C.V.S. Pharmacology Examination (oral and practical), London and Dublin.

Nov. 7th.—Meeting of the Farmers' Club, Royal Empire Society, 2.30 p.m.

Nov. 9th.—Meeting of the N.V.M.A. Technical Development Committee, 11 a.m.

Nov. 11th.—R.V.C. Students' Union Society Annual Ball. (See Notice.)

Nov. 12th.—Dinner of the Southern Counties Division, N.V.M.A., at Southampton (Polygon Hotel), 7.30 p.m.

N.V.M.A. Committee and Council Meetings

The following are the arrangements for meetings of Committees and Council of the Association to be held in London in November:—

Tuesday, November 15th:

11 a.m.—Parliamentary and Public Relations Committee.
2 p.m.—Organising Committee.
4.15 p.m.—Home Appointments Committee.

Wednesday, November 16th:

10 a.m.—Veterinary State Medicine Committee.
2 p.m.—General Purposes and Finance Committee.

Thursday, November 17th:

11 a.m.—**Meeting of Council.**

Friday, November 18th:

10.30 a.m.—**Special Meeting of Council.**

Erratum.—We regret that in our last issue the date of the meeting of the Technical Development Committee, N.V.M.A., was notified as November 2nd and 9th. The reference to November 2nd was incorrect, and members are asked to note that this meeting will be held on November 9th, 1949, at 11 a.m.

* * * * *

Election to Council R.C.V.S.

On page viii of this week's issue there will be found an official notice by the Registrar of the Royal College of Veterinary Surgeons giving details as to the nomination of persons for election to the Council of the Royal College of Veterinary Surgeons in 1950.

Five members of Council will retire in rotation under Section II of the Veterinary Surgeons Act, 1948, and are eligible for re-election. It will be noticed that nomination forms must be returned to the Registrar not later than January 31st, 1950.

It is understood that voting papers will be sent to all members of the Royal College residing outside the Republic of Ireland on or about February 28th, 1950. The intention is that every overseas voter shall receive a complete voting paper in identical form to that of the voting paper received by members at home. It will be recollected, as was pointed out in a previous article,

that there was a considerably increased poll last year, and it is hoped that all members will exercise their privilege of voting should an election take place.

Should only five nominations be made for the five vacant places then it will not be necessary to hold an election.

* * * * *

Nobel Peace Prize Awarded to Lord Boyd Orr

Our readers will have learned with the utmost pleasure that our distinguished honorary member, Lord Boyd Orr, formerly Director-General of the United Nations Food and Agricultural Organisation, has been awarded the Nobel Peace Prize for 1949.

Lord Boyd Orr, scientist, farmer, and nutritional expert, is 69 and retired from the Director-Generalship of the F.A.O. He is now Chancellor of Glasgow University. It was announced early this year that he was one of 23 candidates for the Nobel Peace Prize.

His long and distinguished career since he left Glasgow University, where he obtained the degrees of M.A., M.D. and D.Sc., has been divided into three periods. The first, a medical career, he abandoned in 1914 in order to study animal nutrition at the Rowett Institute, Aberdeen. The third phase, in which he became one of the foremost international experts on nutrition, began when he transferred his attention to human dietetics.

Lord Boyd Orr was elected one of the members of Parliament for the Scottish Universities in 1945, but resigned in the following year on account of his duties with the United Nations. Formerly Sir John Boyd Orr, he was made a baron in the last New Year honours.

Lord Boyd Orr contributed to the recent International Veterinary Congress the opening paper on "The World Food Situation," and in commenting on the award he said that it was probably being made to him because of his proposals to all Governments for a world food plan to double food production. He added: "I think that if the nations had begun to co-operate on this big problem, affecting all mankind, it would have led to better understanding and made it easier to solve the political problems. The majority of countries wanted the plan, and I believe it will still come. The only important thing in the world to-day is to get the nations to co-operate, and any money that I receive with the Nobel Prize will be devoted to that end."

* * * * *

PERSONAL

Birth.—McMillen.—On October 2nd, 1949, to Vi, wife of F. H. McMillen, M.R.C.V.S., a son.

. . . . . .

Marriages.—Brook—Biggers.—On September 10th, 1949, at St. Dunstan's Church, Cranford, Middlesex, Alan B. Brook, M.R.C.V.S., to Jeanne Mary Biggers, B.SC., M.R.C.V.S. Miss P. Turner, M.R.C.V.S., was bridesmaid and Mr. W. Warren, M.R.C.V.S., was groomsman.

Brown—Rapley.—On October 1st, 1949, at St. Thomas of Canterbury Church, Goring-on-Thames, Oxon, Alan M. Brown, M.R.C.V.S., younger son of Mrs. Gwendoline Brown and the late Mr. Walter Brown, of Birmingham, to Doris Phyllis, second daughter of Mr. and Mrs. F. Rapley, of Walthamstow, London.

Wilmot-Smith—Haining.—On October 4th, 1949, at Windermere, John Patrick Wilmot-Smith, M.R.C.V.S., to Rosalys Vida Haining, M.R.C.V.S.

. . . . . .

Mr. John Balden's Retirement.—The Hexham *Courant* records that a century-old family link with Lord Allendale's Northumberland estates has been broken by the recent retirement of two brothers, Mr. John Balden, agent to the estate for the past 49 years, and Mr. Peter Balden, his assistant.

Mr. John Balden, who is a member of the Royal College of Veterinary Surgeons (graduating from the London College in 1895), is believed, at 90 years of age, to be Britain's oldest active estate agent. He succeeded his father, who had been in the service of the Allendale estates for 47 years when he retired in 1900.

Mr. and Mrs. Balden, who celebrated their golden wedding anniversary a few years ago, have retired to Aspatria in Cumberland.

* * * * *

R.C.V.S. OBITUARY

Crawford, William, 2, Hillary Place, Leeds. Graduated Glasgow, May 20th, 1898. Died October 11th, 1949; aged 73 years.

Good, Abraham Frederick, M.R.C.V.S., Capt. late R.A.V.C. (T.A.), Maesyffynon, Aberdare, Glam. Graduated Dublin, July 22nd, 1909. Died October 10th, 1949; aged 69 years.

Edwards, Edward R., F.R.C.V.S. Graduated London, December 20th, 1899; Fellowship, December 13th, 1904. Died at 29, Woodland Way, Petts Wood, Kent, on October 13th, 1949; aged 82 years.

Langford, Edward, Park House, Shaftesbury, Dorset. Graduated London, January 3rd, 1881. Died October 14th, 1949; aged 90 years.

* * * * *

UNIVERSITY OF LONDON LECTURES IN VETERINARY SCIENCE

The University of London announce that a course of three (Special University) lectures in Veterinary Science will be given at the Royal Veterinary College, Camden Town, N.W.1, by Professor R. A. Kelser, D.V.M., PH.D., (Professor of Bacteriology and Dean of the Faculty, The School of Veterinary Medicine, University of Pennsylvania), at 4 p.m., on November 15th, 16th and 17th, 1949.

The syllabus is as follows: *Lecture I.*—Adaptation of Viruses to Different Host Species and Different Tissues; *Lecture II.*—Foot-and-Mouth Disease with Special Reference to Important Facts and Problems Emphasised by the Current Outbreak in Mexico; *Lecture III.*—Rabies and its Control.

The lectures are addressed to students of the University and to others interested in the subject, admission is free, without ticket.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

EXPERIMENTAL PRODUCTION OF OEDEMA DISEASE OF SWINE

Sir,—Oedema disease of swine, which was first described in the English Veterinary literature by Shanks in 1938 as occurring in the north-eastern counties of Ireland, has within recent years assumed economic importance in many counties in Ireland. The disease, however, is not confined to Ireland, occurring also in England, Norway and Holland, and within the past few years it has been observed in Ontario, Canada.

Continuous research work on this condition both in the field and in the laboratory has been in progress since October, 1948, but despite repeated and sustained efforts to reproduce the disease in experimental pigs by diverse routes and varied technique and with various tissues and fluids, this objective, until recently, was not attained. It was considered that, until this was achieved, progress in regard to the elucidation of its aetiology would be greatly retarded if not rendered impossible. The purpose of this advance communication is to record the experimental production of the disease by the intravenous inoculation of supernatant fluid from centrifuged samples of small intestinal contents obtained from cases of the disease received or brought direct from the farm to the laboratory for *post-mortem* examination.

To date 16 fatal cases of the disease have been produced experimentally with material from eight different outbreaks. A limited number of control experiments with similar material from healthy swine have given uniformly negative results. These findings, when taken in conjunction with the negative results following cultural examination of fresh carcases and various inoculations with different tissues and fluids, suggest that the disease is a specific bacterial toxaemia the toxin of which is either already preformed in the food under certain suitable conditions or formed in the small intestine. The disease has been commonly attributed to dietetic causes, but, from the very extensive experience gained at this laboratory in its investigation, no particular feeding-stuff can be incriminated, because it has occurred in pigs fed on rations varying from boiled potatoes and milk to boiled swill.

As this is only to be regarded as an advance note on the progress made in the investigation of this disease, it may briefly be mentioned that in-contact experiments conducted at the laboratory have always yielded negative results. However, in nine premises experiments embracing 90 pigs situated on nine different farms on which the disease had just recently occurred, positive cases of the disease developed in four of the experiments, death of one or more of the experimental pigs occurring within seven to ten days and in one case as late as the 35th day, after introduction to the new premises. The mortality experienced in the experimental pigs was always low and never reached the high figures recorded in the primary outbreaks.

Yours faithfully,

John F. Timoney.

Department of Agriculture,
Dublin.
Veterinary Research Laboratory,
"Thorndale."
Beaumont Road,
September 29th, 1949.